



Kenya ICT Sector Performance Review 2009/2010

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Research ICT Africa

Research ICT Africa fills a strategic gap in the development of a sustainable information society and network knowledge economy by building the ICT policy and regulatory research capacity needed to inform effective ICT governance in Africa. The network was launched with seed funding from the IDRC and seeks to extend its activities through national, regional and continental partnerships. The establishment of the Research ICT Africa (RIA) network emanates from the growing demand for data and analysis necessary for the appropriate and visionary policy required to catapult the continent into the information age. Through network development RIA seeks to build an African knowledge base in support of ICT policy and regulatory design processes, and to monitor and review policy and regulatory developments on the continent. The research arising from a public interest agenda is made available in the public domain, and individuals and entities from the public and private sector and civil society are encouraged to use it for teaching, further research or to enable them to participate more effectively in national, regional and global ICT policy formulation and governance. This research is made possible by the significant funding received from the International Development Research Centre (IDRC) Ottawa, Canada. The network members express their gratitude to the IDRC for its support.

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Executive Summary

This report is based on a review of the ICT sector in Kenya from a supply side perspective. It was undertaken in 2009–2010 but covers the years from 2005–2009 in many instances and is an update of a similar review carried out in 2007. This supply-side analysis has alternated over the last few years with a demand-side survey of individual and household access and usage.¹ The purpose of the study is to create a rich evidence base of the ICT sector developments in selected African countries to enable comparison of policy outcomes in different countries against national strategies and sector performance.

The price of ICT services has decreased in the last three years as the uptake has improved.

In Kenya, ICT issues are considered under various pieces of legislation. The most pertinent document is the amended Kenya Communications Act 1998 (KCA 1998). The Kenya Communications (Amendment) Act 2009 was signed by the President in January 2009. One of the key sections is on electronic transactions (e-transactions), which recognises the convergence taking place in the digital world. While this convergence is a reality, most of the countries Kenya may be competing with, in the area of business process outsourcing (BPO) for example, have stand-alone laws that regulate e-transactions. This Act may need to be reviewed to align Kenya with the international best practice of creating separate legislation for critical aspects of the ICT sectors, and to harmonise with its East African neighbours. Current limitations include not ensuring cross-border recognition and enforcement of electronic transactions.

The KCA Act of 2009 also established a Universal Service Fund under the Communications Commission of Kenya (CCK), but this is yet to be implemented.

There is also the Freedom of Information Bill, which is still pending. This Bill proposes a Commission be established to enforce data privacy and security together with other stakeholders. This report recommends the creation of the two pieces of legislation (data protection and freedom of information) move in parallel.

The national ICT policy of March 2006 is currently under review. Developments within the sector, including increasing convergence of broadcasting and telecommunications, increased need and availability of undersea-fibre bandwidth and the economic blueprint (GOK, 2008a) that the policy needs to take into account. The landing of the undersea cables – Seacom and The East African Marine System (TEAMS) – in 2009 have already had a dramatic affect. The Eastern Africa Submarine Cable System (EASSy) is expected to land in 2010. The landing of the cables brought a lot of consumer expectations but only quality has improved: the reduction in the cost of retail Internet service remains elusive. The Kenyan Government has also invested in building a national fibre backbone, referred to as the National Optic Fibre Backbone Infrastructure (NOFBI), which is under progress.

Within this context it is imperative to understand the key institutions that influence ICT policy formulation and implementation. They are the Ministry of Information and Communications; National Communications Secretariat; Communications Commission of Kenya; the Appeals Tribunal; E-government Directorate; Government Information Technology Services; the Kenya ICT Board; Parliamentary Committee on Energy, Communications and Public Works; and the Monopolies and Prices Commission.

With reference to market structure, the process of migrating to a Unified Licensing Regime started in 2007. It involves a regulatory framework that embraces technological convergence and is based on the principle of technology neutrality. The first licences under the framework were issued in July 2008 and 35 licenses had been issued by the end of 2009.

In terms of market share there were four licensed GSM operators by July 2009: Safaricom; Zain; Orange Kenya; and Essar Telecom Kenya (Yu). This is a significant improvement from 2006, where only Safaricom and Celtel had rolled out their networks, with all the associated duopolistic anti-competitive effects. The seven main Internet Service Providers (ISPs) command a large share of the Internet clients; they include the Kenya Data Network, AccessKenya and Wananchi online. However, the mobile operators have become the largest ISPs with the landing of the undersea bandwidth and the use of the unified licence. By January 2010, Safaricom had sold more than 3.5 million broadband modems.

In terms of access to ICT services, fixed-line service has continued to perform poorly with a rapid decline in growth. This is possibly due to the dramatic growth in the use of mobile phones. The increase in demand for data services, however, has led to an increase in international gateway bandwidth. The bandwidth charges to ISPs have been decreasing since 2005 due to increased competition after the 22 data carrier operators were licensed as at December 2007.

The price of ICT services has decreased in the last three years as the uptake has improved. This can be attributed to the entry of more operators in the industry, resulting in a reduction in end-user tariffs due to low termination rates, enhancing affordability and increased uptake by a population that was not previously served. A key development has been in mobile money transfer products such as Safaricom's M-Pesa and Zain's Zap. M-Pesa, for example, had over 5 million customers and 3400 agents countrywide by July 2009. M-Pesa is considered one of the best global innovations in mobile telephony and has made a huge difference to the unbanked population in Kenya.

This report also includes survey results from various stakeholders on their perceptions of the telecommunications regulatory environment. The respondents gave their views on interconnection, tariff regulation, quality of service, market entry, access to scarce resources, and universal services obligations. In general, at least half the respondents in all categories felt the various aspects of regulation were highly ineffective.

The study also has a number of conclusions and recommendations. These include the need to create a detailed plan for the new ICT policy implementation aligned to the Kenya Vision 2030. There is clearly an overlap in the roles of some of the key institutions, and a need to review the framework for the ICT policy formulation and implementation. There are a number of recommendations on the need to strengthen the CCK in order to have more autonomy in decision-making, to implement mechanisms to regulate tariffs and to improve quality of service among other issues.

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Introduction

Socio-Economic Overview

The real Gross Domestic Product (GDP) grew from 2003, when the National Rainbow Coalition took over, until 2007.

Although the 2009 census results were not available by the time this report was compiled, Kenya's population is estimated to be around 40 million. The real Gross Domestic Product (GDP) grew from 2003, when the National Rainbow Coalition took over, until 2007, when it reached the highest for decades at 7.1%. Following the post-election violence in 2008, real GDP growth fell to 1.7% in 2008, the lowest growth rate recorded since 2003. The economy showed signs of recovery in the first quarter of 2009, recording a growth rate of 3.9% compared to a decline of 0.6% in the first quarter of 2008. The key economic data is shown in Table 1 below:

Table 1: Key Economic Data

Socio Economic Data	
Gross Domestic Product growth	1.7% (2008) 2.0% (2009)
Provisional 2008 growth rates for real GDP Composition by key sectors	3.7% Agriculture 3.2% Mining and quarrying 3.8% Manufacturing 3.1% Transport and communications 8.3% Building and construction 3.7% Real estate, renting and business services 5.8% Education
Total Population	37.2 million (2007) 38.3 million (2008) – provisional
Urbanisation	42% (2005)
Literacy rate	85.1%
Human Development Index	0.541 (2007)
Life expectancy	53 (2006)
Annual average inflation rate	16% (Jan 2009) 8.5% (Jan 2010)
Interest rate	Central Bank Rate at 7% (Dec 2009)
Source: Central Bank of Kenya, KIPPRA, CIA Factbook.	

The Kenya poverty profile reveals strong regional disparities in the distribution of poverty. Inequality in Kenya remains high. The distribution of income, measured by the Gini coefficient¹ was estimated at 39% in rural areas and 49% for urban areas before political tension following the election at the end of 2007. Income disparities in the rural areas have gone down since 1997, while the disparities in the urban areas have increased slightly.

Political Overview

Kenya is a democratic and multi-party state. A Grand Coalition Government was sworn in on April 17, 2008, with Mr Mwai Kibaki of the Party of National Unity (PNU) as President and Mr Raila Odinga of the Orange Democratic Party (ODM) as Prime Minister. The coalition was established under a "National Accord and Reconciliation Agreement" with an equally shared portfolio balance between PNU and ODM following a political crisis and violence after the announcement of the results of the presidential, parliamentary and local government elections of December 2007. The government continues to address short-term issues of national reconciliation and resettlement of internally displaced persons. Long-term issues, including a new Constitution and other essential reforms, have progressed, albeit at a slow pace.

¹The Gini coefficient is a measure of inequality of income distribution—the higher the percentage the higher the level of inequality.

Study Purpose & Methodology

This study – an update of a similar review carried out in 2007 – was conducted under the framework of ResearchICTAfrica (RIA). It reviews the ICT sector in Kenya from the supply-side perspective covering five years from 2004/2005 to 2008/2009, where data was available. The purpose of the study is to create a rich evidence base of the ICT sector developments in selected African countries that will track domestic developments but also allow for comparison of policy outcomes in different countries against national strategies and sector performance.

The study approach is similar to that adopted in the sector review of 2007. The database had the following indicators:

- socio-economic indicators;
- fixed-line service indicators;
- mobile telephone service indicators;
- broadband service indicators;
- public phone service indicators;
- government access indicators; and
- other indicators that do not fall into the above categories.

The data collection involved a review of relevant secondary data, a review of websites of relevant organisations, and one-on-one interviews with experts and managers in the ICT sector in both public and private institutions. The data collected was analysed and forms the basis of this report. The study also includes an assessment of the Telecommunications Regulatory Environment on the basis of stakeholders' perceptions. The informal survey methodology for this was devised by LIRNEAsia and is merely a snapshot of the sentiment within the industry at a particular moment in time. These perceptions, however, are powerful determinants of regulatory risk within the sector and can affect investor confidence. Where positive policy and regulatory developments are not translating into positive sentiment, regulatory agencies should review the communication strategies to ensure that gains are being communicated to stakeholders and the public. Negative sentiment should also be swiftly addressed through communication with stakeholders on how current problems are to be addressed in the future.

The purpose of the study is to create a rich evidence base of ICT sector developments.

Policy and Regulatory Environment

In Kenya, ICT issues are considered under various pieces of legislation. These include the Kenya Communications Act of 1998; the Science and Technology Act, Cap. 250 of 1977; and the Kenya Broadcasting Corporation Act of 1988. The national ICT policy (The Kenya Gazette, 2006) recognises that these Acts are inadequate in dealing with issues of convergence, electronic commerce and e-Government. It thus also recognises the need for a comprehensive policy, legal and regulatory framework in order to:

- support ICT development, investment and application;
- promote competition in the industry where appropriate;
- address issues of privacy, e-security, ICT legislation, cyber crimes, ethical and moral conduct, copyrights, intellectual property rights and piracy.

The most influential document regarding ICT legislation and regulation in Kenya has been the recently amended Kenya Communications Act 1998 (KCA 1998). The KCA 1998, which repealed the Kenya Posts and Telecommunications Act, provides the current framework for regulating the communications sector in Kenya. The Act unbundled Kenya Post and Telecommunication into five separate entities including Telkom, the fixed line operator; the Postal Corporation of Kenya (Posta); the Communications Commission of Kenya (CCK) as the sector regulator; and the National Communications Secretariat (NCS) to advise the government on the adoption of a communication policy. It also created an Appeals Tribunal for the purposes of arbitration in cases where disputes arise between parties under the KCA 1998.

The Kenya Communications (Amendment) Bill, 2008, which was to amend the Kenya Communications Act, 1998, and address some of the challenges cited in the national ICT policy document, was passed by parliament in December 2008 and the President signed it into law in January 2009. One of the key sections is Part VII, on electronic transactions (e-transactions). In this part, the new Act, among other things, gives legal recognition of electronic records; recognises

By including e-transactions in the converged Act, the Ministry rightly recognises the technology convergence that has occurred in the digital world.

electronic messages as valid for the formation of contracts; and supports the use of electronic records and electronic signatures in government and its agencies. The new Act also deals with various aspects of ICT and cyber-crimes.

The CCK announced its intention to implement a unified technology-neutral licensing regime.

Inclusion of e-transactions in the Kenya Communications (Amendment) Act, 2009, is a great step in the right direction. It demonstrates the Ministry of Information and Communications' (MoIC) commitment to e-transactions. By including e-transactions in the converged Act, the Ministry rightly recognises the technology convergence that has occurred in the digital world. While this convergence is a reality that has been recognised globally, most of the countries Kenya may be competing with, in the BPO industry for example, have stand-alone laws that regulate e-transactions. A stand-alone law has sufficient detail to address all the areas of e-transactions. The practice in other countries has been to create separate e-transaction legislation. Examples include South Africa's Electronic Communication and Transactions Act, 2002; India's Information Technology Act, 2002, amended in 2006; Egypt's e-Signature Law No. 15/2004; Philippines Electronic Commerce Act 8792, 2000; and the Singapore Electronic Transactions Act, 2001. For now, Kenya should use the relevant provisions in the Kenya Communications (Amendment) Act, 2009, to spur the growth of the BPO sector. However, in future, this Act may need to be reviewed to align Kenya with the international best practice of creating separate legislation for critical aspects of the ICT/BPO sectors, harmonise with its East African neighbours and the East African Community laws in these sectors, and address certain limitations in the Law. These limitations include not ensuring cross-border recognition and enforcement of electronic transactions, limited range of cyber-crimes and lack of provision for limitation of liability for service providers (intermediaries) for third party content despite the agency involved in e-transactions.

There is also the Freedom of Information Bill, which if enacted, will, among other things, enable the public to access information in the possession of the government and public authorities and certain private bodies that have a public character. This Bill proposes that a Commission be established to enforce data privacy and security together with other stakeholders, such as the Communication Commission of Kenya (CCK). This apparently is what is delaying the process of creating data protection legislation. We recommend that the creation of the two pieces of legislation (data protection and freedom of information) move in parallel.

One notable aspect of the new licensing framework is that the CCK was abandoning network operation licensing based on a 'beauty contest' process in favour of open market-based licensing. The CCK argued that licensing through the beauty contest process, especially in a liberalised market, was "not only unnecessary but undesirable and inconsistent with market dynamics". The problems of using the bidding process were evident in the licensing of rural telecommunications operators (RTOs), commercial trunked radio operators (CTROs) and the third GSM operator, which were generally a failure. In effect, the CCK was abolishing the "beauty contest" in preference to simple issuance of a license if a potential operator meets the requirements, on a first come first served basis. For scarce resources like the frequency spectrum, the CCK considers the auction process as the only viable, transparent and fair allocation method.

In its post-exclusivity statement in 2004, the CCK announced its intention to implement a unified technology-neutral licensing regime. The implementation of this licensing framework was considered a good mechanism to harness the opportunities presented by technological advancements in ICT and to address the regulatory challenges associated with convergence.

Under the unified licensing and regulatory model, operators and service providers will be licensed under three broad market segments:

- Network Facilities Provider (NFP) – to provide infrastructure system for long distance transmission and for local access.
- Applications Service Provider (ASP) – to provide all forms of services to end-users using the network services of a facilities provider.
- Contents Services Provider (CSP) – to provide content services such as broadcast (TV & Radio) material, and other information services and data processing services, etc.

The unified licensing framework (ULF) permits any form of communications infrastructure to be used to provide any type of communications service that an operator or service provider is capable of providing. After delays and discussions with the operators and the public, ULF became effective from late 2008 after the Ministry of Information and Communication issued new policy guidelines through a gazette notice. The guidelines drop the multiple licensing regime, where services were grouped on the basis of services and technology. ISPs (Internet Service Providers), for instance, were formerly required to obtain a separate licence to offer VoIP (Voice over Internet Protocol). The

unified licence has, for example, allowed the mobile operators to become the biggest providers of Internet services. It has also allowed other service providers, such as local loop operators and Internet service providers, to get a new lease of life in previously shrinking businesses.

Some of the benefits of the ULF are that licensing procedures have been simplified, new applications have been developed, and there has been increased penetration and availability of mobile internet as well as increased infrastructure investment.

In the more recent past, the government issued five sets of regulations for the sector in March 2010. These regulations are:

- The Kenya Information and Communications (dispute resolution) Regulations. These stipulate the power of the commission and the process of resolving disputes between consumers and a service provider, two service providers or any other person as may be described in the Act.
- The Kenya Information and Communications (tariff) Regulations to provide a framework for the determination of tariffs and tariff structures. They seek:
 - to ensure licensees maintain financial integrity and attract capital;
 - to protect interests of investors, consumers and other stakeholders;
 - to provide market incentives for licensees to operate efficiently; and
 - to promote fair competition.
- The Kenya Information and Communications (compliance monitoring, inspections and enforcement) Regulations. These stipulate the CCK's power in monitoring and enforcement of installations and maintenance of communication infrastructure.
- The Kenya Information and Communications (fair competition and equality of treatment) Regulations whose purpose is:
 - to provide a regulatory framework for the promotion of fair competition and equal treatment in the communications sector; and
 - to protect against the abuse of market power or other anticompetitive practices within the communications sector.
- The Kenya Information and Communications (interconnection and provision of fixed links, access and facilities) Regulations to provide guidelines on interconnection.

The regulations are expected to have an impact in the sector affecting the various players differently. The regulations were welcomed by Telkom Kenya, Zain and Essar Telekom (Yu), who argued that they would promote fair competition in the industry, level the playing field and benefit the consumers. However, Safaricom, the market leader in mobile voice market (close to 80% market share measured by subscriber numbers), protested against the regulations claiming that they were aimed at the company because it had been successful and that the idea was to curtail its market dominance. Specifically, the protests concerned the lack of definition of market segments in the communications sector, lack of definition of what constitutes abuse of dominance, lack of clarity on the criteria for defining market dominance, and definition on when tariff regulations applied. This protest was sustained in the media for quite some time, with Safaricom threatening to go to the courts if the regulations were not reviewed or withdrawn. The Minister eventually gave in and in May 2010 agreed to review the regulations.

Institutional Arrangements

With the enactment of KCA 1998, the country had created a highly centralised process of policy formulation. The key institutions that can influence ICT policy formulation and implementation are outlined below:

- Ministry of Information and Communications: In a cabinet reshuffle in 2004, a new ministry was created, namely the Ministry of Information and Communications. According to some observers, the previous Minister of Transport and Communication had an uneasy relationship with the private sector. As was the case with his predecessors, the Permanent Secretary's attention under the old ministry of Transport and Communications tended to focus more on the transportation sector than the communications sector. It is this new Ministry of Information and Communications that is in charge of national ICT policy formulation and which eventually delivered the new national ICT policy, which was approved by the Cabinet in January 2006 and came into effect in March 2006.

The unified licence has allowed the mobile operators to become the biggest providers of Internet services.

With the enactment of KCA 1998, the country had created a highly centralised process of policy formulation.

- **National Communications Secretariat:** The National Communications Secretariat (NCS) advises the Government of Kenya, through the Ministry of Information and Communications, on ICT policy. Although NCS took several years to get started, it is the only key organisation with an explicit and legislatively mandated policy function. It is expected to pay particular attention to policies which promote the development of technological capabilities, deliver social services and foster economic growth, and encourage competition and efficiency in the industry, among other goals.
- **Communications Commission of Kenya:** The Communications Commission of Kenya (CCK) is a statutory agency, whose purpose is to license and regulate telecommunications, radio communications and postal services in Kenya. The Communications (Amendment) Act 2009 transformed CCK into the converged regulator. CCK will now regulate information and communications services, which means its regulatory menu now includes broadcasting services. By the time of writing this report, CCK had not started regulating broadcasting services.
- **Appeals Tribunal:** The Appeals Tribunal was established for arbitrating in cases where disputes arise between the parties under the Act. The members of the Tribunal are appointed by the Ministry in Charge of ICT and are responsible to this Ministry. Any dispute in the application of the Act by CCK, for example, is referred to the Appeals Tribunal. The decision of the Appeals Tribunal can be appealed in the highest court – the Court of Appeal. The Tribunal jurisdiction is limited to the interpretation of the spirit of the Kenya Communications Act. One of the first cases the Tribunal handled concerned interconnection. The decision by CCK on the interconnection dispute between Kencell Communications Ltd and TKL was appealed in the Appeals Tribunal. At issue were interconnection rates that TKL felt did not cover the cost of call termination. These rates had been established when the cellular operators were small. In 2003, the Tribunal delivered a judgment revising the interconnection rates between Kencell Communications Ltd and Telkom Kenya Ltd in favour of the latter.
- **Directorate of E-government:** The Directorate of E-government (DEG) was founded in March 2004 in the Office of the President (OP), and a Director was appointed in September of the same year. According to interviewees, the Cabinet saw the need for ICT and thus mandated the creation of this entity. The E-government Directorate is called for as part of the structural composition of the E-government strategy. The official purpose of the DEG, according to the strategy, is to oversee the implementation of e-government strategy and to assist the Government of Kenya to more effectively deliver services to citizens. The E-government strategy proposes that each ministry should have its own ICT department.
- **Government Information Technology Services (GITS):** The predecessor of the Government IT Services was the Micro-Information Systems Department (MISD). In 2000, the MISD was abolished and GITS created. GITS provides computer services to government ministries and departments and some parastatal organisations. GITS writes relevant computer applications, updates existing systems, evaluates system design and conducts feasibility studies. The agency aims to ensure ICT standards within government organisations. GITS remains a technical entity. The head of GITS is at a Director level and reports to the Permanent Secretary, Ministry of Finance. In 2005, GITS was transferred to the e-Government Directorate. However, by the time of writing this report, GITS was still reporting PS/Finance instead of being an integral part of e-Government Directorate.
- **Kenya ICT Board:** The Kenya ICT Board (KICTB) was created by a Presidential Order in 2007. The functions of the KICTB are to: (a) advise the Government on all relevant matters pertaining to the development, co-ordination and promotion of information and communications technology industries in the country; (b) promote both locally and internationally the opportunities for investment in information and communications technology; (c) facilitate and manage information and communications technology industrial incubation parks and technology parks together with associated facilities on sites, estates and land; (d) appoint agents within and without the country to carry out such functions, as it may consider necessary, in accordance with this Order; and (e) carry out any other activity that, in the Board's opinion, will promote and facilitate the development of information and communications technology products and services. These functions have a huge overlap with those of the National Communications Secretariat, especially with respect to advising the government on ICT issues. These overlaps need to be addressed.
- **Parliamentary Committee on Energy, Communications and Public Works:** This Committee provides Parliamentary oversight in one aspect of ICT, communications.

The E-government strategy proposes that each ministry should have its own ICT department.

- Monopolies and Prices Commission: The Monopolies and Prices Commission Act allows the Commissioner to determine matters that may affect competition in the economy, including those that involve companies in the telecommunications business. Monopolies established by an Act of Parliament are however excluded from the Monopolies and Prices Commission (MPC) control. Consequently, the MPC had little effect on telecommunications sector exclusivity until June 2004. In the liberalised segment in the Internet provision, MPC has had a role to ensure competition and control mergers. In 1999, MPC cleared the take-over of an ISP (Net 2000) by another ISP (Africa Online) concurring that the resulting merger did not affect market concentration of Internet business. No other telecommunications related case has been handled by the Monopolies and Prices Commission.

From the above outline, it is clear that ICT responsibilities are distributed in different arms of the government, with little, if any, coordination. The key consequences of having responsibilities in many institutions have been lack of coordination and duplication. Some examples are:

- It is not clear who should develop the BPO/ITES policy between the Kenya ICT Board and the National Communications Secretariat.
- The Kenya ICT Board has been implementing some key E-government applications and the coordination between the KICTB and DEG in implementing these applications is not clear.
- The KICTB has been implementing some universal access projects (e.g. the digital villages project) and it is not clear how it coordinates with the CCK, which has a universal access mandate.

The CCK does not have a formal relationship with the Monopolies and Prices Commission and there has not been a mechanism to regulate competition in the industry. The latest attempt by the Ministry to introduce five types of regulations outlined earlier is one way of beginning to deal with regulation of competition in the industry. However, given the CCK's poor history of enforcing compliance, it would be interesting to watch the CCK's enforcement of compliance to these regulations. Already one of the key players has forced a change to the regulations.²

GATS Commitments

Kenya has, since 1998, made commitments in five areas of telecommunication services:

- fixed telephony;
- mobile telephony;
- value added services;
- internet; and
- audiovisual services.

The specific services committed include telecommunication services except video and audio broadcast, voice telephony services, facsimile services, packet swift data transmission services, telegraph services, electronic mail, and electronic data interchange (Otieno and Aligula, 2006).

With these commitments, however, there are limitations, especially on market access. These limitations include foreign equity limits; public monopoly over basic telecommunications (often for specified periods); prohibition of international call back services; the fact that movement of natural persons is unbound except for managers and other expert staff; that commercial presence in audiovisual services, motion picture and videotape production (except distribution services) is unbound; and that cross-border trade for motion picture projection is unbound (WTO, 2006).

The policy reforms embraced in the Kenyan telecommunications sector since 1998/99 largely coincided with the country's commitments in telecommunications under the GATS framework. Progress from the GATS' commitments includes the CCK's independence from telecommunications suppliers and government; the 2010 regulations by the CCK, which safeguard anti-competitive practices among others; and the existence of procedures for interconnection negotiations, dispute settlement, and for allocation and use of scarce resources. The cost of communication via the Internet and fixed and mobile telephony has substantially gone down with liberalisation of the sector.

It is clear that ICT responsibilities are distributed in different arms of the government, with little, if any, coordination.

² Safaricom protested that the regulations were not well formulated and were targeting it as a company. As a result, the implementation of the regulations was delayed pending review by international experts.

Competition Issues

The policy reforms embraced in the Kenyan telecommunications sector since 1998/99 largely coincided with the country's commitments in telecommunications under the GATS framework.

Telkom Kenya enjoys a monopoly over fixed telephone services because efforts to license a second national operator (SNO) took many years. Even after licensing one (Econet Wireless), there has not been a rollout of fixed-line services. In 2005, Econet Wireless received clearance from the High Court in Kenya to roll out its mobile phone network, after the court ruled that its 15-year GSM licence had been issued properly. This effectively made it the third mobile operator, after the duopoly of Safaricom and Zain (formerly Kencell). In January 2008, Essar acquired a 49% stake in Econet Wireless International Ltd, which in turn owns a 70% stake in Econet Wireless Kenya. Essar Telecom Kenya (formerly Econet Wireless Kenya), started rolling out its mobile network in 2008 under the Yu brand. Due to the delay in rolling out, Essar Telecom became the fourth mobile operator after it was beaten to third position by Telkom Kenya.

The regulator awarded Telkom Kenya (under the Orange brand) a mobile wireless operator license in 2007, which effectively legalised its existing CDMA-based fixed wireless network. The incumbent GSM operators had complained that Telkom Kenya's CDMA network was illegal as the company had not paid for an operating license that the regulator had considered to be a fixed wireless service. Orange rolled out its mobile network in 2008 before Essar Telecom. The launch of Orange mobile service by Telkom Kenya followed France Telecom taking a controlling stake in TKL. Orange is now the commercial brand for the mobile, broadband and fixed wireless services from Telkom Kenya.

Competition has intensified after the ULF, with the large operators diversifying their services and competing in almost all markets. For example, the mobile operators have become the largest ISPs, making business very difficult for the smaller ISPs who do not own infrastructure.

Number Portability

Number portability is a feature that enables telecommunication networks to provide users with the ability to migrate from one service provider and/or service type to another without changing their telephone number. CCK has been holding consultations with the operators and the public since the end of the exclusivity period for Telkom Kenya (2004) on modalities of introducing number portability in the telecommunications industry³ with a view to ensuring promotion of competition, protection of consumers, and fairness and efficiency in this industry. In August 2009, the Commission advertised in the media⁴ that it had completed the first phase of the public consultation process. The summary of the issues and the Commission's views could be accessed at the CCK website.⁵ In the same advertisement, the Commission invited the public to submit comments on views expressed by respondents and the suggested way forward before 28th August 2009. A timetable in the ongoing consultations shows that an independent service provider number portability (SPNP) platform operator would be licensed to manage the reference database by 31st December, 2009.

From the submission of the operators posted on the CCK website, it is apparent that the process could go beyond the tentative timetable. Some issues of concern are the costs of porting to both the customer and operator versus the benefits, need for regulations, tariff transparency, and success of NP in other jurisdictions. The process of consultation has taken over five years and it will be interesting to see how the CCK moves to implement the concept, with the newer operators keen to have SPNP implemented and some resistance from the established operators.

Carrier Pre Selection

The carrier selection code for Kenya is (1XX). The CCK issued a new numbering plan in 2002 in anticipation of a telecommunications multi-carrier environment. This was necessitated by high demand on the existing numbering resources as a result of the liberalisation of the telecommunications sector and the subsequent growth of telecommunications services in the country. The plan provided for introduction of short codes in the range of 1xx to facilitate the selection of the preferred carriers by subscribers. Further, short codes for essential services are in the range of 9xx (e.g. 999 for police) while the cellular mobile subscriber numbers remain at six digits, despite the standardisation of access codes for mobile networks to three digits. According to CCK,

³ For example, the 2nd public consultation paper can be found at http://www.cck.go.ke/closed_consultation

⁴ Daily Nation, August 7, 2009, p.8.

⁵ http://www.cck.go.ke/current_consultations

the subscriber number length for the rest of the country is to gradually change to seven digits during modernisation and expansion of switches. This has not yet been implemented.

New Developments in the ICT Sector

The current national ICT policy is the first for the country and was published through a special issue of the Kenya Government Gazette (GOK, 2006). The vision in this policy is of “a prosperous ICT-driven Kenyan society”. Its mission is “to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services”. This policy is currently under review given the changes that have taken place in the last four to five years and the changes that are anticipated. For example, there is a converged legal and regulatory environment, the undersea fibre bandwidth has landed, there is an economic blueprint (GOK, 2008a) that the policy needs to align to, and there have been and will be many other national, regional and global changes. The National Communications Secretariat was to have a draft policy document by August 2009 that was to be subjected to stakeholder consultation. This has not been done.

The Kenya Vision 2030 represents the blueprint for the country's development up to year 2030 (GOK, 2008a). The vision aims to make Kenya “a globally competitive and prosperous nation with a high quality of life by 2030”. The vision has three pillars, namely the economic pillar, the social pillar and the political pillar. The overall objective of the Kenya Vision 2030 is to realise higher and sustainable economic growth in a more equitable environment, accompanied by increased employment opportunities. The Vision is to be implemented in five successive Medium-Term Plans (MTPs) under the Ministry of Information and Communications, the first of which runs from 2008 to 2012 (GOK, 2008b). The vision of the ICT sector MTP is that “Kenya becomes a information and knowledge based society”. Its mission “is to provide information and communication based solutions and ensure the availability of efficient, reliable and affordable information communication services countrywide”. The overall sectoral goal of the ICT sector MTP is “to facilitate provision of equitable and affordable quality information and communication services countrywide”.

Undersea Cables

Until recently, international bandwidth was largely satellite-based because Kenya did not have an undersea optical-fibre cable. However, this changed when The East African Marine Systems (TEAMS) and Seacom landed at the Kenyan coast in mid-2009 and became operational before the end of that year. Seacom is a private venture while TEAMS is a public-private partnership between the Kenyan Government and local operators. The Kenya Government owns 20% of the share of the cable. Another undersea fibre, Eastern Africa Submarine Cable System (EASSy), is expected to land in 2010.

The arrival of the cables heightened consumer expectations with regard to Internet Services. A key expectation was an immediate drop in Internet prices for consumers. Quality has improved but reduction in the cost of retail (consumer-level) Internet service remains elusive. The average satellite bandwidth cost about US\$3,000 per Mb/s per month before the undersea cable arrived. This has dropped only slightly.

Initial commercial prices for the Seacom cable bandwidth have been quoted between US\$400 to US\$500 per Mb/s per month. Although the wholesale Internet prices have been reduced slightly, the retail prices appear to be stuck at previous satellite costs. Most Internet Service Providers have offered hope of lower prices in the future, but have thus far only offered increased bandwidth for the same price, and have not reduced entry-level prices. The issue of Internet/broadband tariffs not coming down was discussed in the KICTANET forum, with no firm conclusions. At one stage, the Permanent Secretary in the Ministry of Information and Communication threatened that the government could move in and regulate prices. There is still hope that there will be a significant downward trend in these tariffs when the third cable becomes operational later in 2010.

National Fibre Backbone

The Kenyan Government has invested in building a national fibre backbone, referred to as the National Optic Fibre Backbone Infrastructure (NOFBI). The project aims at establishing a national public broadband network with Internet Points of Presence (PoPs) in most district headquarters, including border towns, in order to attract and stimulate private sector participation in the provision of rural telecommunications services. NOFBI is critical in enabling rural areas to access the cheaper and faster undersea cable bandwidth. This infrastructure has been completed through private contractors and extends to 56 urban and rural towns. A tender had been put out for

CCK has been holding consultations with the operators and the public since the end of the exclusivity period.

The Kenya Vision 2030 represents the blueprint for the country's development up to year 2030.

selection of an operator for the cable infrastructure. At the time of writing this report, the Government was in the final stages of evaluation. The plan is to select three operators to operate regional segments of the infrastructure.

Universal Service Fund

A universal access study in 2004 recommended the establishment of a universal service fund (USF). The Kenya Communications (Amendment) Act of 2009 established a USF to be managed and administered by the CCK. The objective of the fund is to facilitate the rapid achievement of national policy goals for universal access to information and communication technologies, with particular focus on rural residents and people with special needs. In August 2009, the CCK invited stakeholders to submit comments before 7th September 2009 on a consultative paper dealing with the implementation of USF on its website (http://www.cck.go.ke/current_consultation). It would be interesting to see how long it will take the CCK to implement the universal fund now that there is an enabling legal framework.

Regional Co-operation on Policy and Regulatory Issues

Kenya takes regional issues seriously and actively participates in and influences regional ICT discussions.

A regional ICT governance study (Waema, 2005) found that Kenya takes regional issues seriously and actively participates in and influences regional ICT discussions, especially in the Community of Eastern and Southern Africa (COMESA) and East African Community (EAC). Kenya has benefited extensively from regional ICT models. The regional study also found that the influence of regional institutions is only restricted to ICT policy development. Even then, this influence is limited. One of the explanations is the existence of multiple ICT policy and programme initiatives, some of which are often in competition with each other. Some of these initiatives have their origins in the “development partners” funding the initiatives with very little ownership from African governments. A second explanation is that regional institutions lack institutional mechanisms to ensure compliance with model policies and frameworks as well as to monitor and evaluate implementation of ICT policy in member countries. This is made difficult by the fact that member states are sovereign states and have no obligation to go by regional policy guidelines.

A further explanation is that the various countries in the region are at various stages of economic, political and social development, making it difficult for member countries to agree upon common priorities and therefore to adopt common models or frameworks. Other reasons are that participation in meetings and other fora of regional institutions is often dominated by the most senior persons in the concerned ministries at the expense of the more junior people who deal with matters on a day-to-day basis, and that there is no clear mechanism to coordinate the inputs of the various ministries involved in a regional institution's agenda.

The regional study further established that regional institutions do not have any significant role in ICT policy implementation and evaluation. Although member countries are entrusted with and expected to carry out implementation and evaluation of ICT policy, most regional institutions do not have mechanisms to track implementation and to gauge the degree of compliance. For Kenya, the institutional framework to ensure implementation and monitoring of policy has not been clear.

Kenya is party to the East African Regulatory, Postal and Telecommunications Organisations (EARPTO) agreements. Details of interconnections among operators in the party states have been implemented and the two main operators, Safaricom and Zain, have roaming services within and outside the member states in the region. Issues relating to the dominant operator have been discussed in EARPTO and the CCK issued regulations in March 2010 where issues of dominant operators and guidelines to be followed to ensure a level playing ground are outlined.

Participation in meetings and other fora of regional institutions is often dominated by the most senior persons in the concerned ministries.

Finally, in the last few years, a number of local institutions and groups have come to exert a significant influence on ICT policy and regulation. The more notable ones include the Telecommunications Services Providers Organisation of Kenya (TESPOK), Kenya ICT Federation (KIF), Kenya ICT Policy Action Network (KICTANET) and the Kenya BPO and Call Centre Society (KBPOCCS). TESPOK represents the telecommunications service providers in Kenya. It has successfully lobbied the government regarding the establishment of the Kenya Internet exchange Point (KIXP) and the liberalisation of very small aperture terminals (VSATs). It also encouraged the government to establish the Ministry of Information and Communications and helped to set up Internet exchange points in other countries in the region.

KIF is the umbrella body which brings together all private sector organisations with an interest in ICT. TESPOK and the Computer Society of Kenya are members of KIF. KIF vigorously lobbied for the finalisation of Kenya's ICT Policy. KICTANET is a civil society organisation comprising a loose network

of donors and NGOs. It collected comments from various parts of civil society in Kenya regarding the ICT policy and forwarded them to the Ministry of Information and Communication (MOIC) for implementation. In general, the three bodies, representing private sector, civil society and donors, played a significant role in the development of the national ICT policy and also influenced regulatory reform.

The ICT Market

Market Structure

The market structure in Kenya is competitive and the licensing framework is converged and technology-neutral with concentration in fixed and mobile segments. The regulatory framework was improved to allow for a technology-neutral and horizontal licensing framework. In 2006, the broadcasting and information technology sectors did not have an official regulatory framework. There were suggestions then (in the Draft Broadcasting Sector Policy Statement of 2000 and the Kenya ICT Policy [2006]) that the CCK should be strengthened to be responsible for regulation of broadcasting and ensure quality and compatibility of ICT products and services. All this has changed with the passing of the Kenya Communications Amendment Act (2009).

The process of migrating to the Unified Licensing Regime, a regulatory framework that embraces technological convergence and is based on the principle of technology neutrality, started in 2007. The first licenses under the framework were issued in July 2008, and by the end of the year, 35 licenses had been issued. The framework does not distinguish between mobile and fixed services, satellite and terrestrial services or data and voice services. The difference in licenses is dependent on which layers of the model one operates in. However, a distinction is made between national and international services.

There are six main licences in the ICT market structure (see Appendix 1 for details):

- National Network Facilities Providers;
- International Network Facilities Providers;
- Non-Infrastructure Based Services Providers;
- Terminal Equipment Providers;
- Private Very Small Aperture Terminals (VSAT); and
- One Time Authorisation.

In essence, this structure provides three levels of operations recognised by the CCK, namely network facilities providers, application service providers and content services providers. The number of licensees in the three broad areas is determined by the market, with the exception of areas where there exist natural limitations such as spectrum availability. The structure allows direct inter-connectivity between all network operators. Operators who fall into more than one category are expected to obtain applicable licenses for all the categories in which they operate. Cross-subsidisation between the various licence categories is not allowed and firms with multiple licenses are required to structure their operations and submit distinct operational accounting returns to the CCK as part of their compliance returns.

This structure does not interfere with the existing frequency and numbering assignment. Spectrum fees are dependent on the amount of spectrum, locality, the coverage of the spectrum (regional, localised or national), and offers made in the bidding/evaluation process. Under the new framework, private network operators are exempted from annual operating fees, but are required to bid in order to access spectrum whenever there are competing needs, and also to pay annual spectrum fees based on bandwidth and coverage of their private networks.

With reference to broadcasting, not much has changed in terms of market structure. As per the Kenya Communications Amendment Act (2009), broadcasting is still categorised under the following market segments:

- Public Broadcasting: Kenya Broadcasting Corporation (KBC) remains the public broadcaster operating commercially but with a universal service obligation.
- Private Broadcasting: these are private entities licensed to provide broadcasting services on a commercial and competitive basis.

Operators who fall into more than one category are expected to obtain applicable licenses.

The CCK is empowered to licence and regulate broadcasting services and promote the development of local content.

- Community Broadcasting: these are fully controlled by non-profit agencies to serve particular communities, for example special interest groups.

However, the Act streamlined and introduced regulatory provisions whereby the CCK became a fully fledged information and communication technology sector regulator which includes broadcasting. The CCK is empowered to licence and regulate broadcasting services and promote the development of local content in addition to allocating frequencies. The key addition to the law is that the CCK has been mandated to set up mechanisms for handling complaints by the public against broadcasters. Attempts to regulate the broadcasting sector have so far met with a lot of resistance from the media.

Market Share

As at July 2009, there were four licensed and operational mobile GSM operators. These are Safaricom, Zain (formally Celtel),⁶ Orange Kenya and Essar Telecom Kenya (Yu), previously referred to as Econet Wireless Kenya. This is a significant improvement from 2006, where only Safaricom and Celtel (currently Zain) had rolled out their networks. In November 2007, France Telecom acquired Orange Kenya (formerly Telkom Kenya) from the Kenyan government. It acquired 55 per cent of the company at US\$55 million, with an aim to transforming the loss-making former government monopoly into a profitable company. Orange Kenya became the country's third mobile network operator in September 2008.

Essar Telecom Kenya (ETK) is the fourth GSM licensee in Kenya. It operates under the Yu brand and offers mobile services. Essar Communications Holdings Limited (ECHL), a subsidiary of India's Essar Global, acquired a 49 percent stake in Econet Wireless International (EWI) in January 2008. Essar had 400,000 subscribers as at June 2009. The other three operators are available in most parts of the country. As at April 2010, Safaricom commanded a market share of 78%, Zain had 14% of the market, Orange Kenya had 4%, and Yu had 1%.

The main Internet service operators are the Kenya Data Network, Jamii Telkom, UUNET, AccessKenya, Wananchi online, Communication Solutions and AfricaOnline. The seven operators command a large share of both individual and corporate subscribers. However, the mobile operators have become the largest ISPs with the landing of the undersea bandwidth and the use of the unified license. By January 2010, Safaricom had sold more than 3.5 million broadband modems and over close to 4 million data modems in total⁷ (EDGE plus Broadband). One could therefore assume that Safaricom had over 4 million Internet users for both EDGE and Broadband, excluding the mobile phone Internet users.

Market Investment & Revenue

High investment could be attributed to investment in infrastructure, which saw the subscribers grow by 66% in the period.

Safaricom and Zain (formerly Celtel) had a combined investment of KSh44.6 billion and combined revenue of KSh46.456 billion during the year 2006/07. This high investment could be attributed to investment in infrastructure, which saw the subscribers grow by 66% in the period. The following year, 2007/2008, the combined investment dropped to KSh21.221 billion, while revenue rose to KSh57.998 billion. As this is the period during which Safaricom was focusing on privatisation it is likely that this is the reason for the reduction in investment.

Table 2 shows mobile revenue and investment from 2005 to 2008. Evidently the annual revenue increased substantially, with 2008 registering a 25.22% increase. This is attributed to the increase in service availability and subscriptions. However, Average Revenue per User (ARPU) has been declining, with 2008 registering a decline of 12.46%. This fall could be driven by a subscriber increase in the low-income group and reduction of tariffs by the mobile operators. According to Safaricom financial reports for 2006/07, 2007/08 and 2008/09, the company registered a monthly ARPU of KSh799 in March 2007, KSh616 in March 2008 and KSh475 in March 2009.⁸ This was a reduction of 22.9% and 22.88% respectively.

⁶ Indian carrier Bharti Airtel has subsequently (March 2010) bought Zain's African operations, excluding Morocco and Sudan.

⁷ Based on interviews with Safaricom staff in February 2010.

⁸ <http://www.safaricom.co.ke/index.php?id=929> (Accessed July 2009)

Table 2: Mobile Revenue and Investment

	2004/05	2005/06	2006/07	2007/08	2008/09
Mobile Annual revenue (KShs millions)	28.393	37.627	46.456	57.998	72.625*
% change in Mobile Annual revenue		32.52	23.46	24.85	25.22
Average Revenue per User – Annual (ARPU) (KShs)	11,151.32	7,148.43	6,328.88	5,110.22	4,473.68
% change in Average Revenue per User		-35.90	-11.46	-19.26	-12.46
Mobile annual investment (KShs billions)	28.920	38.670	44.600	21.221	29.365*
% change in Mobile annual investment		33.71	15.33	-52.42	38.38

Source: CCK Database 2009.⁹ (*) Provisional, Telkom Orange and Econet not included

During the same period, France Telecom announced an investment plan of KSh8 billion (USD 99 million) in Kenyan subsidiary Orange Kenya, and invested KSh10 billion developing the network's infrastructure in 2009. Kenya's fourth mobile services provider, Essar Telecom Kenya (Yu), received KSh7.5 billion from the Pan African Infrastructure Development Fund (PAIDF) to expand its East African operations.

A diversity of alternative revenue sources to compliment voice generated revenue was key for the operators. In line with this, in 2008 Safaricom bought a majority stake in One Communication, which has a Wimax (a wireless internet connection) licence.

According to Safaricom's 2008/2009 financial report,

"... revenue increased to KSh70.48bn in the period compared to KSh61.37bn during the same period in 2008. The increase was driven by voice revenue as the customer base increased during the year. Voice revenue increased by 8.5% to KSh58.80bn representing 83.4% of total revenue whilst SMS, M-PESA & data revenue increased by 83.0% to KSh9.10bn representing 12.9% of total revenue from 8.1% in the prior year. Total M-PESA revenue in the year increased to KSh2.93bn from KSh0.37bn growing to 4.1% of total revenue from 0.6% in the previous year. Data revenue increased to KSh1.51bn or 2.1% of total revenue from KSh0.34bn or 0.5% of total revenue in the previous year."

It has been suggested that voice revenue increased due to reduced costs and also numerous cost-saving promotions. SMS revenue also declined by 9% to reach KSh287,145,378 in June 2008 from KSh315,557,601 in June 2007 (CCK, 2008). According to the CCK (2008), on average the tariffs charged by operators decreased by between 30% and 50%, depending on the mode of payment and tariff plans. Lower end-user tariffs led to the increase of over 25% in incoming and outgoing traffic.

It has been suggested that voice revenue increased due to reduced costs and also numerous cost-saving promotions.

Fixed Telephone Network Revenue and Investment. Although the number of fixed-line subscribers declined by 1.2%, there was an increase in investment of 279.2% from 2006 to 2007. This has also led to revenue growth of 6.6% from 2006 to 2007. The investment shown in Table 3 could be attributed to the expansion of the ADLS, which registered high growth in the last three years.

Table 3: Fixed Telephone Network Revenue and Investment

	2004/05	2005/06	2006/07	2007/08	2008/09
Fixed Annual Revenue (billions)	20.540	17.657	49.211	52.435	52.435*
% change in Fixed Annual revenue		-14.036	178.71	6.55	0
Fixed Annual Investment (billions)	35.416	12.568	5.533	20.980	20.980*
% change in Fixed Annual Investment		-64.51	-55.98	279.18	0

Source: CCK Database, 2009 (Communication Statistics Report 2008/9)⁹ (*) Provisional, data incomplete from Telkom Kenya (Orange).

Revenue and Investment in Internet and Data services. Revenue generated in the Internet and data services improved over the years and by 2008, the Internet market generated close to KSh2.324 billion (US\$33.2 million, at KSh70) while the data services generated KSh5.046 billion (US\$72 million, at KSh70). This is an improvement of 5.9% and 1.77% in the Internet and data services respectively from 2007 to 2008. At the same time the investment in the Internet sub-sector decreased from KSh0.417 billion (US\$6.2 million, at KSh67) in 2007 to KSh0.234 billion (US\$3.3 million, at KSh70) in 2008 as shown in Table 4. On the other hand, investment in the data service more than doubled, from KSh416 million (US\$6.2 million, at KSh67) in 2007 to KSh937 million (US\$13.4 million, at KSh70) in 2008. This could be attributed to the entry of broadband operators e.g. Safaricom, Wananchi, KDN, etc. with better and more affordable offers.

Table 4: Internet and Data services Revenue and Investment

	2004/05	2005/06	2006/07	2007/08	Change (%)
Total annual revenue from internet services (billions)	-	-	2.324	2.460*	5.9%
Total annual revenue from data services (billions)	3.495	4.949	5.046	5.135*	1.77%
Total investment from internet services (billions)	-	-	0.417	0.234*	-43.88%
Total investment from data services (billions)	-	-	0.416	0.937*	125.24%

Source: CCK Database 2009.⁹ (*) Provisional, data incomplete from all DCNOs and ISPs.

Employment

The telecommunications industry has created significant employment, particularly in the mobile sector.

The telecommunications industry has created significant employment, particularly in the mobile sector. However, there was rationalisation of operations, particularly in Telkom Orange and Zain, leading to massive retrenchment. Table 5 shows that Safaricom had the highest number of employees per line followed by Zain and then Yu. Orange Kenya registered more lines per employee in 2009 due to the additional number of lines from Orange Mobile and Orange Wireless in addition to the massive retrenchment.

Table 5: Mobile Operators' employment trend

Operators	2006	2007	2008	2009
Safaricom employees	800	800	1,000	2,387
Safaricom's lines per employee	5,375	9,945	11,956	5,597
Zain employees	600	600	705	564
Zain's lines per employee	3,567	4,568	3,888	5,319
Orange Kenya (fixed, mobile and wireless) employees	18,000	18,000	-	4,000
Orange Kenya lines per employee	16	15	-	403
Yu	0	0	0	350
Yu lines per employee	0	0	0	1,143

Source: Operators annual reports, press releases and media websites 2009⁹ - unavailable data.

The global recession of 2008/9 saw 41 Zain employees retrenched. Orange Telkom retrenched over 14,000 staff in the last three years as part of its re-engineering and rationalisation process. Safaricom has continued to employ, with a staff level of 2,387 as at March 2009. The large increase in employment in 2009 for Safaricom can largely be accounted for by the establishment of an in-house call centre, employing almost 50% of the total employees. Yu was in the process of recruiting staff. However, it is noteworthy that some staff who left Zain moved to Yu.

Access to ICT Services

Fixed Telephone Services

The fixed-line service has continued to perform poorly with a rapid decline over the last decade. This is largely attributed to the rapid growth in mobile phone use. The number of fixed line subscribers has continued to decline from 2006 to 2008 as shown in table Table 6 below. At the end of December 2008 there were about 250,000 subscribers and the trend, in line with other African countries, shows that this will decrease. The Communications Commission of Kenya has attributed this mainly to cable vandalism that affected the operations of Telkom Kenya. However, anecdotal evidence suggested that the ease of acquiring a wireless (mobile) line made people unwilling to endure the long waiting period to be assigned a fixed line. On the other hand, the number of customers waiting to be connected to the wireline network has substantially dropped over the years from a high of 109,758 in 2003/4 to 8,194 in 2007/8. This could be ascribed to a reduction in demand for wireline services as more people move to wireless connections. Other alternatives are likely to occur, with voice over IP services from ISPs and others using broadband connections.

Table 6: Fixed Network Subscribers (Cumulative)

	2003/04	2004/05	2005/06	2006/07	2007/08
Wireline Capacity	531 441	51 382	516 993	505 103	512 281
Wireline connections	299 225	278 867	293 364	263 122	252 615
% change in Wireline connections		-6,80	5,20	-10,31	-3,99
Urban connections	284 264	264 509	279 079	251 924	246 927
Rural connections	14 961	14 358	14 285	11 198	5 688
% Change in Rural connections		-4,03	-0,51	-21,61	-49,21
Waiters	109 758	93 192	64 618	26 925	8 194
% change in Waiters		-15,09	-30,66	-58,33	-69,57
Number of business lines	-	-	-	129 554	128 671*
Number of residential lines	-	-	-	135 328	123 625*
Number of payphones	9 273	8 273	7 913	5 805	5 210*
Source: CCK 2007/08 Annual report and CCK Database, 2009 (Communication Statistics Report 2008/9) (*) Provisional, data from the fixed network operator (Telkom Kenya).					

The number of wire line subscribers has declined over the years.

The number of wire line subscribers has declined over the years with a decline of 10.31% in 2007 while 2008 registered a decline of 3.99%. It is also worth noting the fall in rural connections in 2007 and 2008, a reduction of 21.61% and 49.21% respectively. This can be attributed to marketing and new innovations by mobile phone operators and increasing access from rural areas.

CCK statistics produced between April and August 2009, however, show some positive changes in the fixed line in first half of 2009, as shown in Table 7.

Table 7: Fixed line trend, June 2008 to June 2009

Indicator	June-08	Sept-08	Dec-08	Mar-09	June-09
Subscribers in urban areas	239,948	239,848	237,142	236,926	240,533
Subscribers in rural areas	9,998	7,583	6,599	7,328	7,439
Number of business lines	131,222	131,145	127,747	128,233	130,185
Number of residential	118,724	116,286	115,994	116,021	117,787
Number of Wireline subscribers	249,946	247,431	243,741	244,254	247,972
Source: CCK Database, 2009 (Communication Statistics Report. April to June 2009).					

The slight growth of the fixed lines since the beginning of 2009 is seen to be a reflection of the revitalisation of Telkom Kenya following its privatisation in 2007. The growth is not confined to urban areas, as is demonstrated in Table 6.

The number of public payphones has continued to decrease over the years, registering a total of 5,210 by the end of 2008 compared to 5,805 by the end of 2007 – a 10.25% reduction. This is lower than the previous year, which saw a reduction of 26.64%. This has largely been attributed to vandalism and poor connections. Though this reduction poses a threat to Universal Access, increased mobile penetration and access to mobile community pay phones have significantly increased access to voice services. It is hoped that with the introduction of a Universal Service Fund by the Kenya Communications Amendment Act (2009), there will be increased penetration of ICT services, especially in the rural areas.

The introduction of fixed wireless technology increased the total subscriber base in the fixed network market. Telkom Kenya launched fixed wireless services based on Code Division Multiple Access (CDMA) 2000 technology in the 800MHz frequency band in 2007. Since the CDMA 2000 devices are similar to the mobile handsets, users have been using the service as a mobile substitute. TKL also had the advantage of being exempted from Excise Duty, yet all mobile operators are expected to pay the Excise Duty of 10% applied to services offered by operators owning a mobile license. Therefore TKL was able to offer fixed mobile services at reduced prices compared to the GSM operators. This move attracted opposition from Safaricom and Zain, who argued that Telkom Kenya was offering mobile services in the absence of an adequate license. This led to Telkom Kenya being issued with a license in 2008 to offer mobile services using CDMA and/or GSM technology to comply with the Excise Duty regime applicable to mobile services.

During 2007/2008, Telkom Kenya retired its analogue low capacity links and systems (including Instafone Wireless Local Loop System in Nairobi, multi-access systems, single channel radios, Kitale Digital Radio Multiple Access System-DRMAS) and returned frequencies to the Communications Commission of Kenya (CCK, 2008).

Fixed Wireless Services (LLOs)

The introduction of fixed wireless technology increased the total subscriber base in the fixed network market.

Fixed-network services are offered by Telkom Kenya Limited and two operational Local Loop Operators (LLOs); EM Communications (Popote Wireless) and Flashcom. LLOs are small operators with regional licenses to complement the fixed line services and provide the last mile services. Their license limits their operation within limited distance with long distance traffic transmitted through the fixed network. The combined subscriber base of the two LLOs registered a decline of 6.3% in 2008 compared to a 24.69% growth experienced in 2007 as shown in Table 8.

Table 8: Local Loop Subscribers (Popote Wireless and Flashcom)

Indicator	Dec 2006	Dec 2007	% change	Dec 2008	% change
Total Subscribers	8 481	10 575	24,69	9 908	-6,31
Number of business lines	-	6 028	-	5 647	-6,32
Number of residential lines	-	4 547	-	4 261	-6,29
Source: CCK Annual Report 2007-8 (CCK, 2008).					

This declining trend is expected to reverse once the operators migrate to the Unified Licensing Framework, which is technology neutral. A local loop operator that migrates to Network Facilities Provider (NFP) tier 3 will be able to interconnect with other service providers and therefore allow greater mobility for their customers.

Despite the decline of the LLO customers, fixed wireless subscribers grew from 418,224 in the quarter ending March 2009 to 448,529 in June 2009, representing a 7.2% growth as illustrated in figure below.

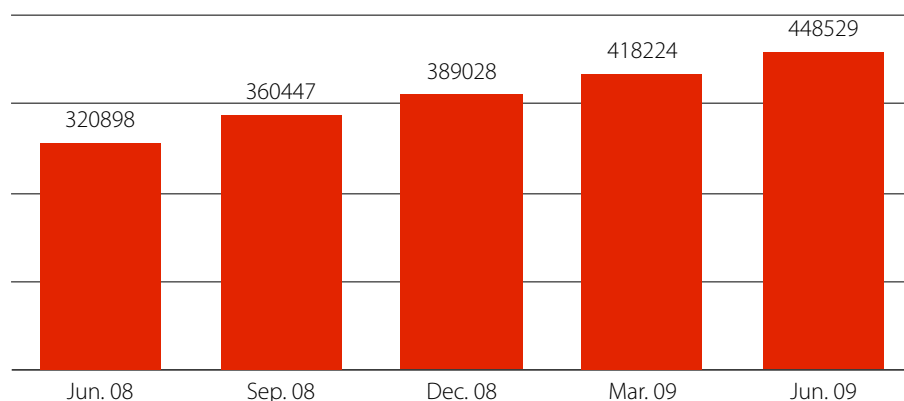


Figure 1: Fixed wireless subscribers

Source: CCK Database, 2009 (Communication Statistics Report, April to June 2009)

Mobile Telephone Services

In 2007/2008, the CCK assigned frequencies and numbering resources to Telkom Kenya and Econet Wireless (Yu) for deployment of GSM mobile networks. The mobile sector has witnessed rapid growth, particularly with the licensing of two new operators in 2008, Orange Kenya and Yu, who started their operations in September and November 2008 respectively. The mobile operators are now targeting lower-income groups and increasing geographic coverage. According to the RIA household survey data⁹ (2007), mobile ownership is not highly dependent on the economic status of the subscribers; it has actually become a necessity for many. Already, telephone penetration has reached levels that can be achieved only if subscribers are members of households that are below the poverty line (assuming phone subscribers are twelve years of age or older). The consequence of this has been a gradual reduction in average revenue per user (ARPU).

As Table 9 demonstrates, the mobile telephone subscribers have been growing at an increasing rate. The slight drop between 2007 to 2008 could be due to lack of accurate data from the mobile operator Zain, which may have more subscribers than those included in the calculation. By mid-2009, the sector had already registered a 6.4% growth rate, a trend likely to continue.

Despite the decline of the LLO customers, fixed wireless subscribers grew.

Table 9: Mobile Subscribers

Operators	Safaricom	Zain	Orange Kenya	Essar Telecom Kenya (Yu)	Total (million)	Total % increment
June 2009	13.36 m	3 m	1 m	0.4m	17.4	6.4%
2008	11.956m	2.741m*	0.4m	n/a	16.70	56%
2007	7.956m	2.741m	n/a	n/a	10.70	66%
2006	4.3m	2.14m	n/a	n/a	6.44	40%
2005	2.5m	2.1m	n/a	n/a	4.6	-

Source: Safaricom annual reports and press releases from Zain,¹⁰ Orange Kenya and Essar.¹¹
 (*)Likely inaccuracy.

⁹ This is sourced from the Research ICT Africa website, <http://www.researchictafrica.net/>

Telephone penetration has reached levels that can be achieved only if subscribers are members of households that are below the poverty line.

The period leading to 2007/08 saw the number of subscribers grow by 55.8%, with a 41.9% increase in 2008/09. This increase is supported by an increasing penetration rate for mobile services as shown in table 10. It is to be noted that the period had reached 44%, while 83% of the population was covered by 2008/2009.

Table 10: Mobile penetration and coverage

Indicator	2005/06	2006 /07	2007/08	2008/09
Mobile Penetration (%)	15.74	21.62	30.51	43.64
Population coverage (%)	-	-	82	83
Land Coverage (%)	-	-	31	32

Source: CCK Database, 2009 (Communication Statistics Report 2008/9).

The increase in mobile penetration can be attributed to the competitive effects resulting from the increased number of mobile operators, increased mobile coverage and availability of low denomination calling cards from both Safaricom (KSh20) and Zain (KSh50). It is also to be noted that the number of subscribers for Orange and Yu grew by 1 million and close to half a million respectively within their first year of operation.

There has been an increase in infrastructure sharing among the mobile phone operators. For example, Safaricom shares towers with Zain and Orange through reciprocal arrangements. Essar Telecom Kenya (Yu) also shares Zain's towers and base stations.

Broadband Services & Internet

The new market structure and unified licensing framework introduced in 2008 is expected to stimulate growth in the sub-sector.

Among the telecommunication services, the Internet has been the least accessible service in the country. The low uptake of this service can be attributed partly to lack of infrastructure due to reliance on satellite before cables landed in Mombasa, and the limited relevant local content and limited PC ownership. Although the CCK had issued 127 licenses to Internet Service Providers (ISPs), only 50 were operational. The new market structure and unified licensing framework introduced in 2008 is expected to stimulate growth in the sub-sector. Further, enhancement of the competition regulatory framework, as well as operationalisation of the national fibre backbone is expected to boost Internet penetration.

Broadband refers to a new generation of high-speed transmission services which allow users to access the Internet at significantly higher speeds than traditional modems. Broadband services had been a preserve of the ISPs. However, mobile operators and Local Loop Operators have diversified their services to offer broadband services both in offices and homes.

The CCK assigned Safaricom with spectrum for commercial rollout of 3G services after a successful one-year trial period in 2007. The 3G packet-based data network offers a number of advantages over the existing circuit-switched methods used for transporting mobile voice and is set to increase call volumes and support multi-media data applications. By February 2010, Safaricom had 600 base stations (BTSs) with 3G (against 2,100 with Edge) and planned to add another 400 3G BTSs in 2010/2011.

By the end of 2008, the mobile telephony sector had a total of 392,964 broadband mobile Internet users and by June 2009, the number had increased to 1,801,876 (a growth rate of 358.5% as shown in the Table 11).

Table 11: Growth of internet subscribers including broadband (Jun 2008–Jun 2009)

Indicator	June-08	Sep-08	Dec-08	Mar-09	June-09
Number of leased line customers	1,558	1,695	1,809	2,002	2,789
% change		8.8	6.7	10.7	39.3
Number of dial up customers	8,897	7,696	7,846*	6,902	7,231
% change		-13.5	1.9	-12.0	4.8

Mobile data/Internet subscribers	388,199	392,964	392,964	1,674,948	1,801,876
% change		1.2	0	326.2	7.6
Total wireless subscribers including mobile data/Internet	394,950	398,140	398,190	1,704,948	1,814,183
% change		0.81	0.01	328.17	6.41
Total Internet subscribers	405,444	407,531	407,845	1,713,852	1,824,203
% change		0.51	0.08	320.22	6.44
Internet users (Cumulative)	2,900,205	3,043,442	3,359,552	3,409,896	3,648,406
% change		4.9	10.4	1.5	7.0

Source: CCK Database, 2009 (Communication Statistics Report, April to June 2009).

Mobile data/Internet made the highest contribution to Internet penetration due to the aggressive rollout of data services by mobile operators. For example, interviews with key Safaricom personnel in February 2010 indicated that the firm had so far sold about 3.5 million data-enabled or broadband modems¹⁰ and another 250,000 narrowband (EDGE) modems. This makes the total number of modems sold by Safaricom alone as 3.7 million. If we assume about two thirds are actively being used, Safaricom alone has over 2.5 million active mobile users.

The RIA household survey data (2007) established that most users obtain access through their place of work, training institutions or Internet cafés. The introduction of smart mobile phones and GPRS/EDGE has meant that a large number of users are beginning to access the Internet over a mobile connection, as illustrated earlier. In addition, operators like Jamii Telkom and Telkom Kenya are building fibre terrestrial networks in urban areas across Kenya. The availability of these services is likely to significantly increase Internet penetration in the country.

International Gateway Bandwidth

The increase in demand for data services led to an increase in international gateway downlink and uplink bandwidth between 2006 and 2008. The total international gateway bandwidth increased from 174.43Mbps in 2007 to 1,421.15 Mbps in 2008. This represents a growth of 8.9% in 2006, 200.6% in 2007 and 171% in 2008 as shown in Table 12.

Table 12: International Gateway Bandwidth (Cumulative)

Indicator	Dec 2005	Dec-06	Dec-07	Dec-08
International Gateway Downlink Bandwidth (Mbps)	89.89	100.96	379.5	828.31
International Gateway Uplink Bandwidth (Mbps)	70.28	73.47	144.9	592.84
Total International Gateway Bandwidth (Mbps)	160.17	174.43	524.4	1,421.15
% Total bandwidth growth		8.9%	200.6%	171%

Source: CCK Database, 2009 (Communication Statistics Report 2008/9).

The bandwidth charges to ISPs have decreased from since 2005 this is attributed to increased competition after the 22 data carrier operators were licensed as at December 2007. The period between June 2008 and June 2009 has recorded a drastic increase in International bandwidth as demonstrated in table Table 13. It is not clear ere was a drastic increase by March 2009. This could

Operators like Jamii Telkom and Telkom Kenya are building fibre terrestrial networks in urban areas across Kenya.

¹⁰ This is how aggressive Safaricom has been in entering the data market after the landing of the undersea cable. The other mobile operators have been following suit with all manner of promotional initiatives.

be due to the hype that preceded the landing of the undersea bandwidth. Since the commercial use of the undersea bandwidth started after mid mid-2009, there has been a phenomenal increase in total international bandwidth. For example, the educational and research institutions under the Kenya Educational Network (KENET) was consuming more than 500 Mbps by the beginning of 2010, and planned to increase to more than 1 Gbps before the end of the year.

Table 13: International Gateway Bandwidth June 2008–June 2009.(Cumulative)

Indicator	June -08	Sep-08	Dec-08	Mar-09	Jun-09
International Gateway Downlink Bandwidth (Mbps)	595.84	823.69	828.31	1,886.4	1,985.75
International Gateway Uplink Bandwidth (Mbps)	313.6	315.44	592.84	714.50	760.80
Total International Gateway Bandwidth (Mbps)	909.44	1,139.13	1,421.15	2,600.90	2,746.55
% Total bandwidth growth		25.3	24.8	83.0	5.6

Source: CCK Database, 2009 (Communication Statistics Report, April to June 2009).

Table 14 shows the bandwidth charges to the ISPs. The percentage reductions have been steady over the years with no significant difference, except for 2008 which showed a 30.26% reduction.

Table 14: Broadband bandwidth charges to ISPs

	2005	2006	2007	2008
Bandwidth charges for 256kbs	119,000	109,420	99,840	-
% change		-8.05	-8.76	
Bandwidth charges for 512Kbs	231,200	215,440	199,680	-
% change		-6.82	-7.32	
Bandwidth charges for 1,024Kbs	455,600	422,800	390,000	272,000
% change		-7.20	-7.76	-30.26

Source: CCK Database, 2009 (Communication Statistics Report 2008/9).

Operators have often defended their high prices by arguing that they will first recover their investment.

Operators have given conflicting information on expected reduction in broadband tariffs after the operationalisation of the undersea fibre cable. Operators have often defended their high prices by arguing that they will first recover their investment. They have promised improvement in data transmission speeds. Data collected from the large operators in February 2010 shows that the prices are considerably lower and – 1Mbps guaranteed bandwidth was about US\$600 per month (at KSh76 to the dollar), down from over US\$3,700 per month in September 2009.

Table 15: Commercial broadband bandwidth cost in February 2010

	Cost in KSh/month (February 2010)			
	CCK average, Sep 2009	Safaricom General	KDN	Wananchi (Zuku)
Guaranteed bandwidth (Kbps)				
256	38,625	12,500	12,000	
512	72,276	23,000	24,000	
1024	282,102	48,000	48,000	
Shared bandwidth				
256			999	1,499
512			1,999	2,500
1 Mbps			3,999	4,500

Source: CCK Database, 2009; operators websites 2010.

Recent Developments

There have been major developments in the recent past for both terrestrial and submarine cables. The telecommunications infrastructure received a major boost with the landing and commissioning of the East Africa Submarine Systems (TEAMS) and SEACOM as well as the license award to Kenya Power and Lighting Company (KPLC) to roll out telecommunication infrastructure that will see operators buy excess capacity from the firm.

The CCK has also established policy guidelines on infrastructure sharing in an effort to ease the investment burden of new entrants into the market and avoid duplication of resources. The initiative was embraced by two mobile operators, Zain and Essar Telecom, their having entered into an agreement to share infrastructure.

The government's move to exempt VAT on all telephones for cellular and wireless networks in the 2009 budget was a significant development in the telecommunications market too. This move is expected to promote affordability, increase penetration and reduce the cost of customer acquisition.

There is clear evidence of the effects of the impact of convergence of services and the subsequent Unified Licensing Framework (ULF). The announcement by a data firm that they would self-provide telecommunication infrastructure to offer broadcasters video and audio transmission service over an IP network is indicative of this. The strategy, which fully harnesses technological convergence, is expected to significantly reduce the cost of broadcast transmission.

The National Terrestrial Fibre Optic Network (FONN). Three companies – SAGEM, ZTE and HUAWEI – were contracted by the government to construct a National Terrestrial Fibre Optic Network (FONN), aimed at providing terrestrial links to major towns and commercial hubs. It is also referred to interchangeably as the National Fibre Optic Backbone Infrastructure (NOFBI). Over 5,000km of fibre optic cable was laid down all over the country at a cost of US\$130m through the NOFBI. It is to be operated by Telkom Kenya on behalf of the Government of Kenya. The plan is to extend this infrastructure to the borders of neighboring countries like Tanzania, Uganda and Ethiopia. This initiative is expected to increase Internet and business communications access in both urban and rural Kenya, complementing the undersea cables and ensuring maximum utilisation of capacity. In addition, other operators such as Jamii Telkom and Kenya Data Networks (KDN) are laying down their own fibre infrastructure across the country.

Submarine Fibre Optic Cables. Two submarine cables, The East African Marine Systems (TEAMS) and SEACOM landed in Mombasa in mid 2009 and were operational before the end of that year. The Eastern African Submarine Cable System (EASSy) cable landed in mid-2010.

The East African Marine Cable (TEAMS). The East Africa Marine System (TEAMS) Ltd is a KSh6.5 billion Government of Kenya special purpose vehicle created to lay a fibre-optic sea cable connecting the East African region to the world's communications backbone. The 4,500km long cable was constructed by Alcatel. The project is based on a Public Private Partnership (PPP) with the shareholding distributed as shown in table 16.

Table 16: TEAMS' Shareholding

Kenya government (20%)	Kenya Data Networks (10%)
Safaricom (22.5%)	Wananchi Telecom (5%)
Econet Wireless Kenya Ltd (10%)	Access Kenya (1.25 %)
Telkom Kenya (22.5 %)	Jamii Telecom (3.75%)
7.5% was not allocated as at 1st August 2009	
<i>Source: Ministry of Information and communication, 2009.</i>	

TEAMS will buy onward capacities for its cable that ends in Fujairah (United Arab Emirates). The TEAMS project was initiated in response to the delays with the EASSy cable.

Seacom. Seacom is a privately funded outfit with Tyco Telecommunications as the contractor for the 15,000km long cable. The investors are shown in Table 17. The cable is estimated to cost US\$700 million (KSh56 billion). It has a capacity of 1.28 Terabytes per second. The cable links South Africa, Madagascar, Mozambique, Tanzania, Kenya, India and Europe.

The government's move to exempt VAT on all telephones for cellular and wireless networks in the 2009 budget was a significant development.

Seacom is a privately funded outfit with Tyco Telecommunications as the contractor for the 15,000km long cable.

Table 17: Seacom shareholders

Industrial Promotion Services - an arm of the Aga Khan Fund for Economic Development (25%)	Convergence Partners (12.5%)
Venfin Limited (25%)	Shanduka Group (12.5%)
International Herakles Telecom with (25%)	
<i>Source: Seacom website.</i>	

The Eastern African Submarine Cable System (EASSy). The Eastern African Submarine Cable System (EASSy) project is co-owned by a number of telecommunication companies in Eastern and Southern Africa. EASSy was the first initiative proposed to connect countries of eastern and southern Africa via a high bandwidth fibre optic cable system to the rest of the world, but has experienced a significant delay compared to SEACOM and TEAMS. Alcatel-Lucent is the contractor after it won the tender at a cost of US\$ 300 million. The project shareholders are shown in table 18.

Table 18: EASSy Shareholders

Sudan: Sudatel	Tanzania: Tanzania Telecommunications Company Limited
Djibouti: Djibouti Telecom	Madagascar: Telma
Somalia: Dalkom	Mozambique: Telecommunication de Mozambique
Kenya: Telkom Kenya	Pan-African telecom trade association: ATU
South Africa: Telkom SA, Neotel, MTN Group	
<i>Source: Eassy Website.</i>	

The cable provides connectivity to at least five landlocked countries.

The cable links eight countries covering about 10,000 km. It runs from South Africa to Port Sudan, with landing points in six counties along the Indian Ocean, and provides connectivity to at least five landlocked countries.

A summary for the three undersea cables is provided in table 19.

Table 19: Summary of Fibre Optic Cables

	SEACOM	TEAMS	EASSy
Landing	Land in Mombasa in July 2009	Landed in Mombasa in June 2009	Landed in early 2010
Proprietors	SEACOM is a fully funded private sector project with most of the ownership in the hands of African entrepreneurs. About 76 per cent of the shareholding in the cable is African while the remaining 24 percent is owned by international stakeholders.	The project is a joint venture between TEAMS Ltd, that owns 85 per cent (the consortium of Kenyan operators), and Eitsalat 15 per cent (Dubai Telecom operator).	The project, funded by the World Bank and the Development Bank of Southern Africa, was initiated in January 2003.
Cost and capacity	Cost of US\$700 million (KSh56 billion) for 1.2 Tb/s 15,000km fibre optic cable	4,500km fibre optic cable Original design capacity of 40 Gb/s The project increased capacity to 1.2 Tb/s at an estimated cost of US\$94 million	The estimated cost of the cable is US\$205m 10,000km fibre optic cable along the Eastern coast of Africa Cable capacity not clear from existing literature

The expected benefits of the cable are to:

- Link Kenya with business hubs in Europe, South Africa and India;
- Enable transmission of massive data at high speed;

- Decrease telecommunications costs are expected to go
- Encourage Intra-African and direct access to worldwide international cable networks;
- Diminish reliance on expensive satellite communication;
- Reduce data costs from US\$7000 per megabit of bandwidth to below US\$500 per megabit;
- Open up the entire east African region, especially in the business outsourcing industry; and
- Significantly lower bandwidth costs and encourage growth of small business while giving a competitive edge to big business in terms of business communications.

E-Applications and Services. Mobile money transfer products have become the latest value-added services from the mobile operators. Safaricom's M-Pesa and Zain's Zap are currently in operation. Telkom Kenya plans to launch its service, Orange Money, while Essar Telecom Kenya (Yu) plans to introduce a mobile phone money transfer service in conjunction with Opal Pay. Money transfers are not yet a revenue generation stream for the operators according to both Safaricom and Zain.

M-Pesa was launched in March 2007, and is mainly used to transfer money, buy airtime and pay bills. The distribution network is based on agents who were already present in markets, requiring only basic training. Three months after its launch, M-pesa had 400 agents, compared to 450 bank branches and 600 ATMs in Kenya. It commanded over 5 million customers and 3,400 agents countrywide as at the end of July 2009. M-Pesa is considered one of the best global innovations in mobile telephony and has made a huge difference to the unbanked population in Kenya.

The Ministry of Education has made available the Kenya Certificate of Secondary Education and Kenya Certificate of Primary Education results via SMS in the last three years. As a result, candidates are able to get their results within the same day of their release through ng their registration number to a designated code within the same.

The Ministry of Education has made available the Kenya Certificate of Secondary Education and Kenya Certificate of Primary Education results via SMS.

Cost of ICT Usage

The cost of ICT services has reduced in the last three years as the uptake has improved. This can be attributed to a reduction in end-user tariffs resulting from low termination rates, enhancing affordability and increased uptake by a population that was not previously served, and also to the entry of more operators in the industry. This has resulted in most subscribers having dual phone subscriptions to take advantage of reduced on-net calls. Anecdotal evidence suggests that almost 10% of subscribers have two phones or SIM cards.

Anecdotal evidence suggests that almost 10% of subscribers have two phones or SIM cards.

Mobile operators have also had a number of promotions, especially with the increased competition in 2008–09. For example, Safaricom offered a free call promotion towards the end of 2008, leading to a drastic increase in the local mobile call traffic and a reduction in SMS traffic. It is noteworthy that this free promotion led to the clogging up of the network and it was almost impossible to get a Safaricom to Safaricom call. For a number of business calls, some acquired Zain lines and were willing to pay for the service rather than rely on a free service that they could hardly use. Nevertheless, they still used their Safaricom lines when they could.

The reduction in costs has affected the operators' revenue, with Zain registering an increase in customers to its network but a reduction in revenue after the launch of its promotional tariff "Vuka" at the end of 2008.

Retail

Fixed Network Services. In the last three years, Telkom Kenya has launched a number of products to address customer needs. For example, in 2007, it launched a package dubbed "Corporate Reach" targeting big companies, offering subsidised rates at KSh1,000 for 750 minutes per month to fixed-line office extensions accessed over the subscriber's mobile device. The company launched other tariffs including KSh14 for calls to other networks, dubbed "Furaha" tariff that had, in addition, a group package called "Shikamoo" for five family members or friends that cost KSh5, and a credit-sharing scheme called "Pasha."

In October 2008, Orange Kenya announced a new initiative that united the fixed-line customers with GSM customers. This was promoted under the banner of the "Niaje" tariff. All Orange Mobile to Orange Mobile voice calls were charged at KSh1 per minute. Calls to and between Orange Fixed Plus (Telkom Fixed lines) were charged at KSh7 per minute. Calls to non-Orange mobile services

were charged at KSh14 per minute. All SMSes across all networks within Kenya were charged at KSh1. This was, however, a promotional package.

Table 20 shows a comparison of the tariffs levied by Telkom Wireless with those levied by the two operational LLOs for the period 2008/9, before Telkom Wireless reviewed its tariffs in June and did away with peak and off-peak differences as the other two local loops operators had. The tariffs for Popote wireless and Flashcom were still valid as at July 2009.

Table 20: Local Loop Operators tariffs in 2008/09

Telkom Wireless Tariffs (per sec billing in KShs)					Popote Wireless (per sec billing in KShs)		Flashcom (per Sec billing in KShs)	
		Post-paid	Pre-paid		Post-paid	Pre-paid	Post-paid	Pre-paid
Same network (Orange fixed, orange mobile and orange wireless)	Peak	5	6	Same network	5.50	7.00	4.00	5.00
	Off Peak	5	3	Other LLOs	5.50	7.00	5.50	7.00
Other networks (LLOs and mobile phones)	Peak	19	14	To TKL (Country wide)	19.00	23.00	8.00	9.00
	Off Peak	14	7	To mobile phones	12.00	14.00	12.00	14.00
	Sms national	3.50	3.50	Sms national	3.00 2.00	3.00	5.00	5.00

Source: Operators websites, June 2009.

As indicated, the tariffs for Telkom wireless were for 2008 until June 2009. In June 2009, Telkom Kenya made pricing changes. Tariffs for calls within the company's network dropped to KSh4, while calls made to other networks were reduced to KSh8 per minute from KSh14. Prepaid customers paid a rate of KSh4 per minute for on-net calls to Orange Mobile, Orange Fixed Plus and Telkom Fixed lines, and KSh8 per minute across networks, all day and all night. This was the lowest tariff on the market for both off-net and on-net calls.

The cost of mobile services has reduced rapidly in the last two years in line with the trend in the ICT sector.

Mobile Services. The cost of mobile services has reduced rapidly in the last two years in line with the trend in the ICT sector. This is due to increased competition, customer awareness and increased mobile services. Competition demanded that operators reduce their costs. In 2008 and 2009, increased competition from two new entrants (Orange Kenya and Essar Telecom Kenya (Yu)) and an aggressive promotion distorted mobile services pricing. The price war, kicked off by Zain's "Vuka" tariff, offered KSh8 per minute across networks. At the time of the launch of the "Vuka" tariff, Safaricom was charging KSh15 per minute for across network calls. Safaricom, reacted by reducing its charges to KSh3 per minute from a high of KSh10 per minute within the network, and KSh8 across networks, on its "Jibambie" tariff promotion that ran in December 2008.

The KSh14 that Orange Kenya was charging to other networks during its promotion was a disservice to its growth since it had low volumes of customers and hence needed to call across networks. Given the existence of the "Vuka" tariff by Zain, therefore customers were not adequately persuaded to cross over. They have since revised their tariffs as discussed earlier. This is an interesting perspective considering that KSh1 for SMSes was the cheapest across all networks. Yet, there are many customers who have been locked into Safaricom and Zain due to network externalities and other services offered which require them to be registered to the two networks. One of these is Safaricom's M-PESA initiative explained in the next section. On the other hand, Essar Telecom Kenya (Yu) launched another promotional package. It had the lowest charges at the end of 2008 with a charge of KSh7.50 per minute (billed per second) and KSh2.00 per SMS across all networks. The latest mobile entrants had the lowest tariffs in the market as at December 2008, with Safaricom average tariffs being KSh17.80, Zain KSh11.56, Telkom Orange KSh9.63 and Yu KSh7.50.

With the high dependency on revenue generated by call charges, price wars posed a threat to the industry's future profitability. The promotional tariffs translated into poor performance on Average Revenue per User.

The average tariffs for the mobile operators from 2004 to 2008 are shown in Table 21. The table further illustrates how prices came down in 2008. In one year the charges within network dropped by 45% while across networks the drop was by almost 10% (9.37%). The charges to fixed networks also dropped by almost 50% (48.7%) while international charges came down by almost a third (28.6%).

Table 21: Mobile Average Tariffs (KSh)

Indicator	Oct-Dec 2004	Oct-Dec 2005	Oct-Dec 2006	Oct-Dec 2007	Oct-Dec 2008
Charges to same network	20.18	19.23	18.89	16.43	8.98
% change on same network		-4.71	-1.77	-13.0	-45.34
Charges to another mobile network	32.38	27.37	26.69	22.63	13.26
% change on another network		-5.01	-0.68	-4.06	-9.37
Charges to fixed network	28.76	27.51	25.52	22.75	11.67
% change on fixed network		-4.35	-7.23	-10.85	-48.70
International call charges	99.79	99.79	98.25	71.97	43.39
% change on International calls		0	-1.54	-26.28	-28.58
SMS same network	5.00	5.00	5.00	4.47	3.04
SMS to another network	5.00	5.00	5.00	5.03	3.69
International SMS	10.00	10.00	10.00	10.00	10.00

Source: CCK Database, 2009 (Communication Statistics Report 2008/9).

This reduction is mainly due to the reaction to the two new mobile operators – enticing promotional packages were offered that forced Safaricom and Zain to reduce their tariffs in order to retain their subscribers and expand their market share. The international charges also dropped by 26.28% in 2007 and 28.58% in 2008 compared to a 1.54% drop in 2006. This could be attributed to the legalisation of Voice over Internet Protocol (VOIP) at the end of 2006.

Broadband Services Tariff. Mobile operators, LLOs and some ISPs have been offering broadband services. As at June 2009 Orange Telkom had started massive broadband promotions, with the cost of Internet modems ranging from zero to KSh5,000 on a prepaid basis, and per minute rates at KSh1 to KSh3 per Kilobyte of data. Table 22 shows the broadband charges for Safaricom and Zain as at May 2009.

Table 22: Safaricom and Zain Broadband Tariffs

Safaricom Data services						Zain Data services	
Plan	Tariff(Incl. VAT)	Amount (KSh)	Plan	Tariff(Incl. VAT)	Amount (KSh)	Monthly usage (Excl. VAT)	KSh/MB
Pre-pay	Top-up KSh250 to get 40MB	6.25 per MB	Post-pay Bundle (Per month)	700 MB	1,999	300MB to 499MB per month	9
	Top-up 500 to get 100MB	5.00 per MB		2 GB	3,999	500MB and above	8
Pre-Pay Bundle	300 MB	999	Post-pay (Per month)	5 GB	6,999	Unlimited Internet	KSh3,999
	700 MB	1,999		8 GB	10,000		
	1GB	2,499		30 GB	30,000		
	2 GB	3,999					
Broadband Modem, 3,999 and Broadband Router 25,000.						Modem. KSh3,999	
Source: Safaricom and Zain websites (June 2009).							

In June 2009 Zain lowered the cost of its unlimited Internet package service whereby subscribers signing up for the service got unlimited Internet for KSh2,995 per month, down from KSh3,999, as well as a free USB modem. New subscribers to the service (only accessible to post-paid users) paid a

With the high dependency on revenue generated by call charges, price wars posed a threat to the industry's future profitability.

A monthly fee of KSh999 on a prepaid basis was sufficient for average Internet users to have full Internet access for a month.

deposit of KSh5,000, down from KSh10,000. However, subscribers were expected to sign up for minimum of 12 months.

Safaricom had also taken a dominant position in the broadband services, with its tariffs as at July 2009 for both postpaid and prepaid users shown in the table above. From the tariffs, a monthly fee of KSh999 on a prepaid basis was sufficient for average Internet users to have full Internet access for a month with an investment of KSh3,999 for the modem.

The LLOs are also offering broadband services at the rates shown in Table 23.

Table 23: LLO Broadband Tariffs (Popote , Flashcom and Telkom Wireless)

Data and voice	Popote wireless	Flashcom	Orange Kenya wireless	ADSL Home 256K*	ADSL Home 512K*	ADSL Home 1MB*
Minimum monthly charge voice only	500.00	2,999	Monthly tariff (in KSh)	2,999	4,999	6,999
Unlimited: voice within network	1,500.00		Upload speeds	128 kbps	256 kbps	256 kbps
Unlimited: Internet	3,500.00		Download speeds	256 kbps	512 kbps	1 Mbps
Unlimited: voice within network + Internet	5,000.00		WiFi Connectivity	Free WiFi connectivity for every Livebox		
Data all the time. Per Minute billing	N/A	3.50				
Equipment cost	-	Free PC/USB modem with 2 months sub.	(Livebox)	3,990		
Source: Operators' websites (June, 2009).						

The Tariffs include VAT. Broadband and Internet access are likely to be the drivers for growth of the fixed wireless network, which has faced challenges not only in expanding its customer base, but also in retaining customers.

Internet service operators have responded to the mobile phones' and LLOs' encroachment into their traditionally perceived areas by offering broadband packages as bundles for small business, large business and the home users. Zuku, a product of Wananchi Online, using WIMAX wireless technology, offers bundles for the Small office/Home Office (SOHO) and Small and Medium Enterprises (SME) markets. Table 24 shows the rates for AfricaOnline, Wananchi Online and Access Kenya broadband services.

Table 24: ISP's Broadband Tariffs

AfricaOnline		Wananchi Online		Access Kenya		
Bandwidth	Monthly fee (KShs)	Bandwidth	Monthly fee (KShs)		Time	Monthly (KShs)
(InfiNet Pro) up to 256 Kbps speeds (max)	23,198.85	(Prosurf) 256Kbps unlimited connection	2,999.00	Premium Package	All day (7 am – 6 pm) 32 /32 up and downlink	6,000
					All night (6pm – 7 am) 64/256 up and downlink	
(InfiNet Classic) up to 128Kbps speeds (max)	9,278.85	(Supersurf) 512Kbps unlimited connection	5,999.00		All weekend (Saturday 1 pm – Monday 7 am) 64 / 256 up and downlink	
(InfiNet Lite) up to 128Kbps speeds (max) Access from 7pm to 7am during weekdays and 24/7 during weekends	3,999					
				Value Package	All day (7 am – 6 pm) 32 /32 up and downlink	4,000
					All night (6 pm – 7 m) 64/128 up and downlink	
					All weekend (Saturday 1 pm – Monday 7 am) 64 / 128 up and downlink	
Equipment & installation	15,999	5,800		12,500		

Source: Operators’ websites. (June 2009).

Source: Operators' websites. (June 2009).

As noted, the pricing for the three operators ranges from a maximum of KSh23,198.85 to a minimum of KSh2,999 inclusive of VAT depending on the speed and operator specific charges. Judging by the pricing, there is a clear attempt to address the needs of the market, ranging from large to small businesses. However, the prices are above the broadband tariffs for the mobile operators and LLOs. Furthermore, the low bandwidth offered by the operators indicates that a scarcity of the resource would be addressed by the fibre optic cables.

Other Internet Services. In the Internet market, increased competition has led to a reduction in the cost of international bandwidth over the years. By the end of 2008, the cost of 1Mbps of bandwidth was KSh272,000 per month, down from KSh390,000 in June 2007 as previously shown. By February 2010, these prices had come down to KSh48,000 per month as indicated earlier. It is anticipated that these costs will continue declining with increasing competition and roll out of fibre optic infrastructure in the country and with competition in international bandwidth provision.

Interconnection

One of the short-term regulatory requirements recommended to realign call termination was for the CCK (also referred to as the Commission) to issue a Determination on Interconnection rates

The fixed wireless network has faced challenges not only in expanding its customer base but also in retaining customers.

which the Commission issued as Determination No.1 of 2007 on Cost-based Interconnection Rates for Fixed and Mobile Telecommunication Networks.¹¹ The Interconnection Determination became effective on the 1st March 2007 and is binding to all the fixed and mobile telecommunications network operators operating in the Republic of Kenya, superseding all the previous rulings made by the CCK on mobile and fixed interconnection rates.

Interconnection rates in Kenya are in line with the rates forecast using the Long Run Incremental Cost (LRIC) model.

The implementation of the interconnection rates is based on a glide path and therefore requires operators to continuously enter into new Interconnection Agreements and submit the same to the Commission. Operators are, however, at liberty to negotiate lower interconnection rates subject to the capped rates provided in the Determination. The implementation was divided into three phases with the first phase starting in March 2007, second phase starting March 2008 and the third and final phase starting in March 2009. The cost-based interconnection rates are shown in Table 25.

Table 25: Cost-based Interconnection rates

	1st March 2007	1st March 2008	1st March 2009	1st March 2010
Mobile Termination	6.28	5.27	4.42	*****
Fixed Termination				
Local termination	1.74	1.65	1.61	1.67
Single tandem termination from tandem exchange	3.23	3.03	2.90	3.01
Double tandem termination from tandem exchange	4.82	4.35	3.61	3.76
Single tandem termination from local exchange*	5.48	4.98	4.89	5.08
Double tandem termination from local exchange*	6.27	5.71	5.59	5.81
Fixed Transit				
Transit local exchange to tandem (single tandem)	2.57	2.31	2.27	2.30
Transit local exchange to tandem (double tandem)	3.37	3.05	2.99	3.06
Tandem to tandem transit	1.08	0.98	0.96	1.01
Local to local transit (single tandem)	4.86	4.38	4.30	4.35
Local to local transit (double tandem)	5.66	5.12	5.02	5.10
<i>Source: CCK 2009.</i>				

The first phase was faced with challenges. However, the second and third phases had better implementation, with two more players – Orange Kenya and Yu – entering in the market. They negotiated and signed agreements with the other operators on the basis of the rates in the second phase.

The reduction ensures that interconnection rates in Kenya are in line with the rates forecast using the Long Run Incremental Cost (LRIC) model for an optimal service provider. The Reduction in interconnection costs has contributed to the reduction in tariffs between operators, with average tariff reductions ranging from 15% for postpaid calls to the same network and 37% for postpaid calls to fixed networks.

During the implementation of the second phase, the market experienced intense wars on tariffs as operators introduced differentiated services and promotional offers. Some of the promotional offers did not comply with the interconnection guidelines, resulting in complaints of anti-competitive behaviour in the market. Whereas the current regulations (section 96(1)) clearly compel operators to file tariffs, it does not make provisions on how to deal with promotional offers, thereby posing a challenge on the conclusion of the complaints.

¹¹ http://www.cck.go.ke/review_of_implementation/ (Accessed June 2009)

Wholesale

The CCK conducted a network cost study on retail and wholesale prices in the Telecommunications market in 2006/07.¹²

Facility Leasing and Sharing. Wananchi online signed a deal with Kenya Power and Lighting Company (KPLC) Ltd.¹³ that will see it take advantage of the fibre laid by KPLC running along the electricity lines. Replicating KPLC's power transmission network gives Wananchi access to the more than one million electricity customers and substantially reduces the cost of cable TV transmission, which is currently only possible with the expensive infrastructure support involving the digging of trenches to lay terrestrial cables. Other operators (e.g. Safaricom) also started signing agreements with KPLC to extend their network reach.

The CCK conducted a network cost study on retail and wholesale prices.

Telecommunications Regulatory Environment Survey

The Telecommunication Regulatory Environment survey of 2009 was aimed at evaluating the perception of key players based on a methodology developed by LIRNEasia.

Data Collection Methodology

The stakeholders were sensitised on this study during the East Africa Internet Governance Forum (EAIGF) held in Nairobi from September 7th to 9th 2009. The Kenya RIA team leader made a presentation to the participants giving the project background, the scope, and the expectations for each of the three questions. At the presentation, participants expressed interest in participating in the survey and gave their contact details. Some of the respondents preferred to respond to the hard copy questionnaire, which they were given, and their responses were updated in the online survey tool.

A list of potential respondents had been prepared before the research started to ensure that there was a balance of respondents from the various sectors. The respondents' were initially classified into the following sectors:

- telkom and mobile operators, ;
- associations, NGOs, public-private partnerships organisations;
- banks and travel organisations;
- universities and research institutions; and
- donor organisations and the media.

These categories were later collapsed into the three broad categories as per the RIA classification. A total of 87 potential respondents belonging to the three sectors were purposely selected for the survey and a questionnaire sent to them regardless of whether they had filled in the hard copy or not. The responses of those who had filled in the hard copy survey tool, were filled in online for them.

The data collection officially started on 7th September and it was closed on the 26th of October.

Replicating KPLC's power transmission network gives Wananchi access to more than one million electricity customers.

¹² http://www.cck.go.ke/review_of_implementation/ (Accessed June 2009)

¹³ <http://www.businessdailyafrica.com/Company%20Industry/-/539550/624684/-/u90pimz/-/index.html> (Accessed July 2009)

A list of potential respondents had been prepared before the research started.

Categorisation and Weighting

The respondents were categorised in three main categories as shown in table 26.

Table 26: Respondent categories

	Categories	Responses	Used responses
1.	Stakeholders directly affected by Telecom sector regulation e.g. Operators, Industry associations, Equipment suppliers, Investors	20	19
2.	Stakeholders who analyse the sector with broader interest , e.g. Financial institutions, Equity Research Analysts, Credit Rating Agencies, Telecom consultants, Law firms	19	19
3.	Stakeholders with an interest in improving the sector to help the public e.g. Academics, Research organisations, Journalists, Telecom user groups, Civil society, Former members of regulatory and other government agencies, Donors, Current government employees from organisations related to the telecom sector EXCLUDING those in MoIC and the CCK	19	19

Presentation of Results

Fixed-Line Sector Respondents. Responses from the fixed-line sector are presented in Figure 2 below.

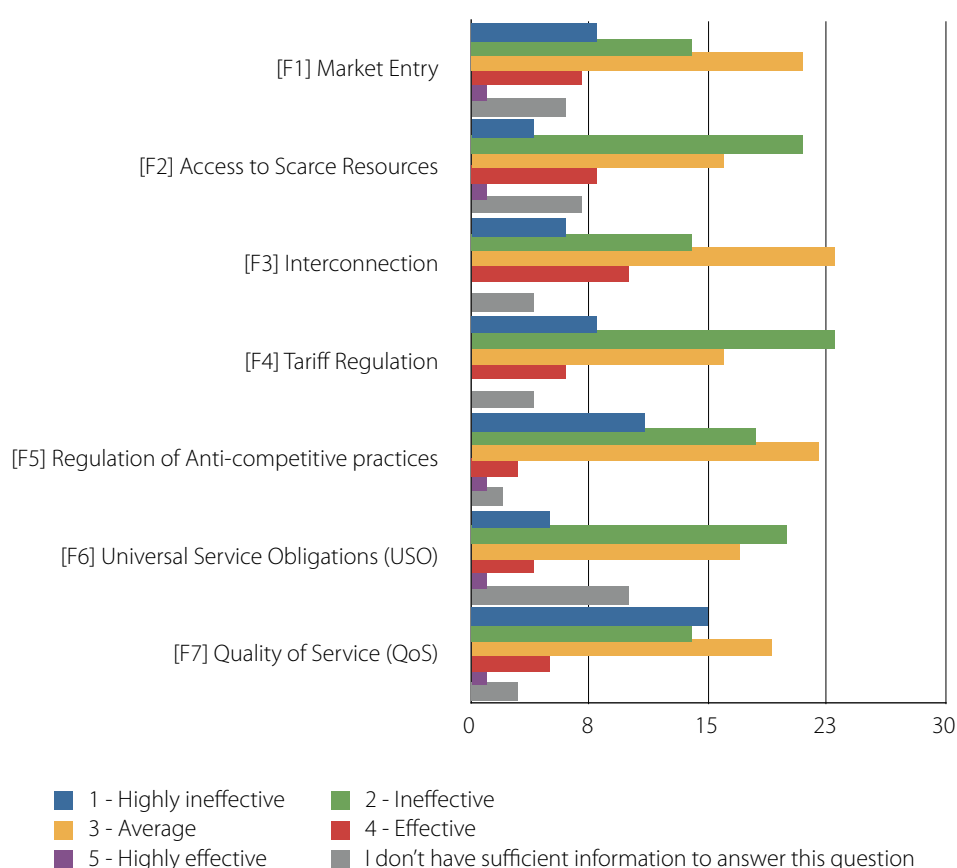


Figure 2: Fixed Line Sector Responses

Please tick the number that best represents the quality of the regulatory environment for each dimension of the fixed sector over the past three years. The lower number represents Highly Ineffective and the higher number represents Highly Effective. If you feel you do not have sufficient information about a particular question, then choose: "I don't have sufficient information to answer this question".

The following comments were received in relation to the fixed-line sector (quoted verbatim.):

- I appreciate the strides that have been made in the last three years by practitioners in the ICT sector since adoption of the PPP Model, I choose not to complain because we have taken tremendous steps.
- I would like to suggest tariffs of mobiles calls to be reviewed downwards and also interconnection across the other networks to be lowered.
- We have a regulatory environment where we have many operators, yet the market still appears like a monopolistic one and in many cases, the consumers are caught between the rock and a hard place. For individual consumers, price is the key issue; for the corporate consumers, quality and reliability are key issues.
- Fixed network sector is on the decline and little effort is being done to revive it by the regulator. CCK has not taken up its full mandate of enforcing Anti-competitive practices and tariff regulation. Consumer protection issues have not been represented adequately
- I have resolved to say average on the above categories since they are neither effective nor highly effective.
- The website of CCK is not quickly updated and information is not easy to locate.
- There is serious quality of service issues in respect of call quality. The number of call fails and call drops is high. CCK should make sure that this information is publicly available and tracked on a continuous basis. The public should know. The negative economic impact of poor service quality is in excess KSh20 billion, which is what consumers pay for poor quality services.
- From reports by ISPs and other licensees of CCK (Government), the license fees are restrictive and therefore a barrier to market entry for new players. This has resulted in an oligopoly and therefore consumer interests such as regulation of anti competitive prices and quality of service have not been looked into.
- Fixed sector is insignificant and therefore whatever framework that CCK may have implemented has had no impact.

There is serious quality of service issues in respect of call quality.

Obviously some of the comments are misplaced and could apply to other sections.

Mobile Sector Respondents. Responses from the Mobile sector are presented in Figure 3.

The sector has experienced advanced and innovative services and products.

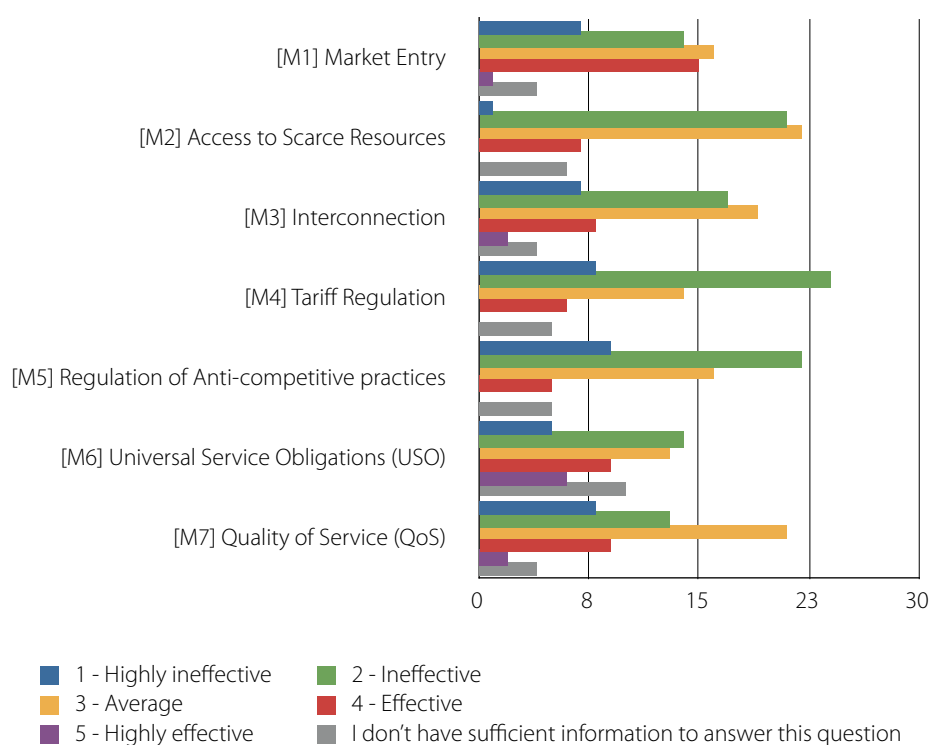


Figure 3: Mobile Sector Responses

Please tick the number that best represents the quality of the regulatory environment for each dimension of the mobile sector over the past three years. The lower number represents Highly Ineffective and the

higher number represents Highly Effective. If you feel you do not have sufficient information about a particular question, then choose: "I don't have sufficient information to answer this question".

The following comments were further received in relation to the Mobile sector (quoted verbatim):

- Considering the uptake of mobile services and the learning curve, I would like to recommend the regulator and players in the industry for a sterling job, taking into consideration the investments they have made, it has been great. This sector has had a profound socio-economic impact on the country.
- Tariffs to be lowered across the board.
- The sector has experienced advanced and innovative services and products but the benefits of such investments and profits have not trickled down to the consumers except in the case of M-Pesa.
- QoS for voice in the mobile telephony sector has not been addressed adequately. For instance Safaricom, which has the largest subscriber base, experiences poor voice quality and high call drop rates yet no tangible effort is being done to correct this.
- I still feel that QoS is a challenge on the networks that have many subscriber levels. Call dropping being one of the main challenges. On call quality and clarity I think so far good measures have been taken.
- On the issue relating to anti-competitive practices, it may have more to do with the fact that CCK advised the Government poorly in regards to the definition of a dominant operator and their general reluctance over the years to use their discretion to declare certain market players as dominant which would lead to certain obligations brought to bear in an attempt to make the market more equitable. This serves the purpose of allowing the dominant players to play anti-competitive tricks and hide behind the lack of a determination as to their dominance.

Internet is still too expensive for the common man.

VANS/ISP Sector Respondents. Responses from the Value Added Network Services (VANS)/Internet Service Provider (ISP) sector are presented in Figure 4.

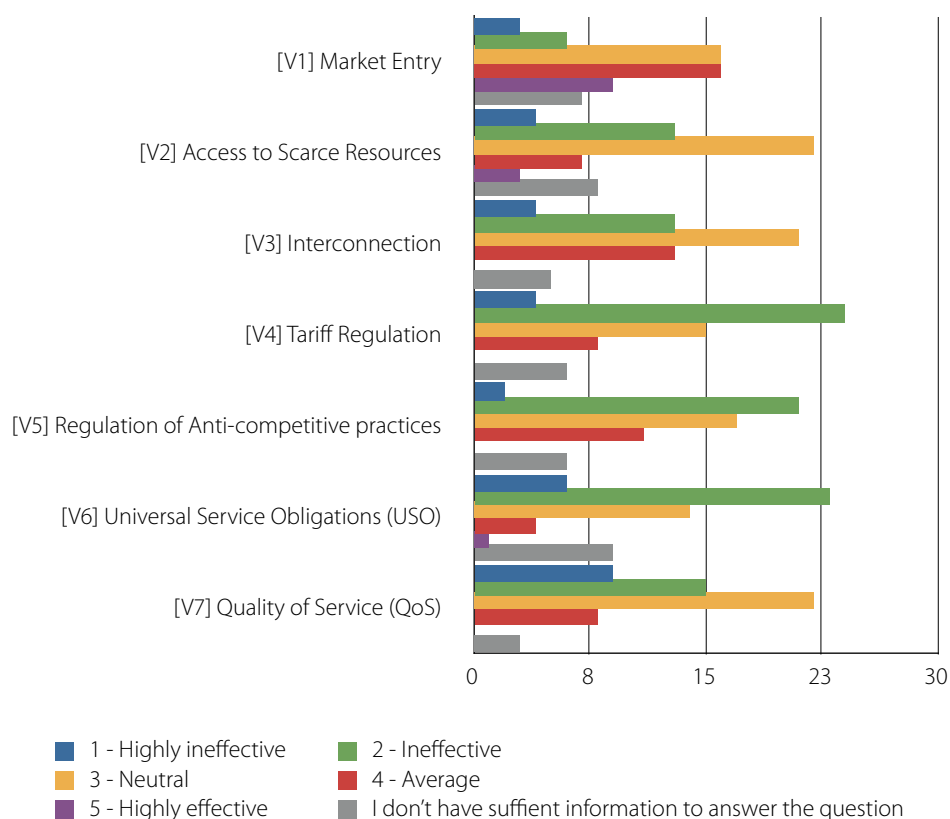


Figure 4: VANS/ISP Sector Responses

Please tick the number that best represents the quality of the regulatory environment for each dimension of the Value Added Network Services (VANS)/Internet Service Provider (ISP) sector over the past three years. The lower number represents Highly Ineffective and the higher number represents Highly Effective. If you

feel you do not have sufficient information about a particular question, then choose: "I don't have sufficient information to answer this question".

The following comments were further received in relation to the VANS/ISP sector (quoted verbatim):

- Considering the type of infrastructure that was at their disposal and uptake of their services by the market, I commend the ISPs and the regulator for a good job, we couldn't have arrived at our present status without the mistakes we made.
- Internet is still too expensive for the common man. Review requirements for ISPs so as to have a number of them offering affordable services.
- Through TESPOK, the operators and service providers have been collaborating in terms of policies and regulation. They need to add the consumers voice into their initiatives.
- Internet Access has not been properly opened up to common mwananchi due to limited access and high tariffs.
- For ISPs I feel that QoS needs to be defined and bench marked. For example when I purchase bandwidth of a specific capacity say 512Kbps. What I do not get from my ISP is the ratio of users on the same link – 1:4, 1:10, etc. So I pay for 512K but during peak times the share ratio is so high I do not get to enjoy my service. On VANS I would applaud ZUKU for their triple play services which I consider a Value Add. All the cellular operators provide Internet services and CCK has no solution to the diverse charging practices.

Interpretation of Results

The respondents were asked to fit in their responses in the following five categories:

- 1 - Highly Ineffective
- 2 - Ineffective
- 3 - Average/Neutral
- 4 - Effective
- 5 - Highly Effective
- I don't have sufficient information to answer this question

Dominant operators have not been properly regulated despite the existence of regulatory mechanisms.

The table below summarises the responses in the three sectors.

Table 27: TRE findings

Dimension	Fixed Sector	Mobile Sector	VANS/ISP sector
Market Entry	Requirement description. Transparency of licensing. Applicants should know the terms, conditions, criteria and length of time needed to reach a decision on their application. License conditions and exclusivity issues.		
	38.6% found the market entry in the fixed line sector to range between highly infective, and ineffective. 36.8% found it to be average 14.1 % found it ranging between effective and highly effective. 10.5% of the respondents did not have sufficient information to answer the question	36.9% found the market entry in the mobile sector to range between highly infective and ineffective 28.1% found it to be average 28.1 % found it ranging between effective and highly effective 7% of the respondents did not have sufficient information to answer the question	43.9% found it ranging between effective and highly effective. 28.1% found it to be neutral 15.8% found the market entry in the Value Added Network Services (VANS)/ Internet Service Provider (ISP) sector to range between highly infective and ineffective 12.3% of the respondents did not have sufficient information to answer the question
Access to Scarce Resources	Requirement description. Timely, transparent and non-discriminatory access to spectrum allocation. Numbering and rights of way. Frequency allocation, telephone number allocation and tower location rights.		

Table 27: TRE findings

Dimension	Fixed Sector	Mobile Sector	VANS/ISP sector
	43.8% found access to scarce resources in the fixed line sector to range between highly ineffective and ineffective 28.1% found it to be average 15.8% found the distribution to range between effective and highly effective 12.3% did not have sufficient information to answer the question.	38.6% found access to scarce resources in the mobile sector to range between highly ineffective and ineffective 38.6% found it to be average 12.3% found the distribution to range between effective and highly effective 10.5% of the respondents did not have sufficient information to answer the question.	38.6% found it to be neutral 29.8% of the respondents found access to scarce resources in the VANS/ISP sector to range between highly ineffective and ineffective 17.6% found the distribution to range between effective and highly effective 14% of the respondents did not have sufficient information to answer the question.
Inter-connection	Requirement description. Interconnection with a major operator should be ensured at any technically feasible point in the network. Quality of interconnection comparable to similar services offered by own network. Reasonable rates for interconnection. Unbundling of interconnection. Interconnection offered without delay. Sharing of incoming and outgoing IDD revenue. Payment for cost of interconnection links and switch interface. Payment for cost of technical disruption of interconnection.		
	40.4% found it average 35.1% of the respondents found the Interconnection to range between highly ineffective and effective 17.5% found it ranging from effective to highly effective 7.0% of the respondents did not have sufficient information to answer the question.	42.1% of the respondents found the Interconnection in the mobile sector to range between highly ineffective and effective 33.3% found it average 17.5% found it ranging from effective to highly effective 7.0% of the respondents did not have sufficient information to answer the question	37.5% found it neutral 30.3% of the respondents found the Interconnection in the VANS/ISP sector to range between highly ineffective and effective 23.2% found it ranging from effective to highly effective 8.9% of the respondents did not have sufficient information to answer the question. (One respondent did not answer this question)
Tariff Regulation	Requirement description. Regulation of tariffs charged from consumers.		
	54% found tariff regulation to range between highly ineffective and ineffective 28.1% found it average 10.5% found it to range from effective to highly effective 7% of the respondents did not have sufficient information to answer the question	56.1% found tariff regulation in the mobile sector to range between highly ineffective and ineffective 24.6% found it average 10.5% found it to range from effective to highly effective 8.8% of the respondents did not have sufficient information to answer the question	49.1% found tariff regulation in VANS/ISP sector to range between highly ineffective and ineffective 26.3% found it average 14% found it ranging from effective and highly effective 10.5% of the respondents did not have sufficient information to answer the question

Table 27: TRE findings

Dimension	Fixed Sector	Mobile Sector	VANS/ISP sector
Regulation of Anti-competitive practices	Requirement description. Anti-competitive cross subsidisation. Using information obtained from competitors with anti-competitive results. Not making technical information about essential facilities and commercially relevant information available to competitors on a timely basis. Excessive prices, discrimination and predatory low pricing. Refusal to deal with operators and other parties. Vertical restraints. Technical disruption of interconnection. Sharing of towers and facilities by parent company and subsidiaries in different segments of the market.		
	50.9% indicated that regulation of anti-competitive practices ranged from highly ineffective to ineffective 38.6% found it average 7.1% found it ranging from effective to highly effective 3.5% did not have sufficient information to answer the question	54.4% indicated that regulation of anti-competitive practices in the mobile sector ranged from highly ineffective to ineffective 28.1% found it average 8.8% found it ranging from effective to highly effective 8.8 % of the respondents did not have sufficient information to answer the question	40.3% indicated that regulation of anti-competitive practices in VANS/ISP sector ranged from highly ineffective to ineffective 29.8% found it neutral 19.3% of the respondents found it ranging from effective to highly effective 10.5 % did not have sufficient information to answer the question
Universal Service Obligations (USO)	Requirement description. Administration of the universal service program/fund in a transparent, non-discriminatory and competitively neutral manner and it is not more burdensome than necessary for the kind of universal service defined by the policymakers.		
	43.9% of the respondents indicated that the universal service obligation ranged between highly ineffective and ineffective 29.8% found USO to be average 8.8% ranged from effective to highly effective 17.5% of the respondents did not have sufficient information to answer the question	33.4% of the respondents indicated that the universal service obligation in the mobile sector ranged between highly ineffective and ineffective 22.8% found USO to be average 19.3% ranged from effective to highly effective 17.5% of the respondents did not have sufficient information to answer the question	50.9% of the respondents indicated that the universal service obligation in the VANS/ISP sector ranged between highly ineffective and ineffective 24.6% found USO to be neutral 8.8% ranged from effective to highly effective 15.8% of the respondents did not have sufficient information to answer the question
Quality of Service (QoS)	Requirement description. The actual performance of a service with respect to what is promised, depending upon the network traffic control mechanisms. Specific criteria may be call quality (for mobile and fixed), connection speeds or throughput (for broadband)		

Table 27: TRE findings

Dimension	Fixed Sector	Mobile Sector	VANS/ISP sector
	50.9% of the respondents indicated that the quality of service (QoS) ranged between highly ineffective and ineffective 33.3% found it to be average 10.6% find it ranging from effective to highly effective 5.3% of the respondents did not have sufficient information to answer the question	36.8% of the respondents indicated that the quality of service (QoS) in the mobile sector ranged between highly ineffective and ineffective 36.8% found it to be average 19.3% found it ranging from effective to highly effective 7% of the respondents did not have sufficient information to answer the question	42.1% of the respondents indicated that the quality of service (QoS) in the VANS/ISP sector ranged between highly ineffective and ineffective 38.6% found it to be neutral 14% found it ranging from effective to highly effective 5.3% of the respondents did not have sufficient information to answer the question

The following are some explanations of some of the key observations and findings:

- **Licence fees as barriers to entry.** Some of the license fees are very high and act as barriers of entry to new or small to medium operators. For example, in the mobile sector, the 3G license; which has been set at US\$25 million. This effectively gave Safaricom monopoly over 3G products. The CCK was forced to bring it down to US\$10 million after complaints from the three of the four operators who had not bought the license.
- **High tariffs.** The tariffs have been high largely because of lack of competition; Telkom has continued to dominate the fixed-line services while, until 2008, there was a duopoly in the mobile services sector. There have been obstacles to regulatory intervention intended to bring down tariffs. One of the key ones is the resistance from the dominant mobile operator. Indeed it is indeed due resistance that the implementation of the new regulations has been suspended. The implementation of all the regulations gazetted would bring down tariffs and improve quality of service. The other key obstacle has been the lack of will to intervene in regulating tariffs by the regulator.
- **Quality of services.** The quality of mobile calls has been low. While the CCK is said to have purchased a quality of service monitoring system called Q-voice in 2007, at a cost of Kshs 50 million (US\$750 000), the derived benefits from its use have not been evident. This could partly due to the lack in the past of a structured way frame of for comers relating with the regulator in the past. the last two years, a directorate of consumer affairs was created to deal with consumer issues, a sign that quality of service is a priority for the regulator.
- **Dominant operators.** Dominant operators have not been properly regulated despite the existence of regulatory mechanisms in the existing regulations. The implementation of the new regulations that tried to regulate dominance were suspended after the dominant mobile operator complained.
- **Universal services.** A universal access strategy was developed in 2006 but this was never implemented. The amended Communications (Amendment) Act 2009 allowed for the establishment of a Universal service SendFund. Under the Act, a levy shall be charged by the Commission on the licensees for purposes of the Universal Service Fund. This has received mixed reactions and even resistance from some of the operators. For example, a common argument by the large mobile operators is that they are meeting the universal service obligations by providing services in rural areas. However, according to CCK sector statistics (March 2010), the mobile population coverage is 84.5% while the land coverage is 34%. This is a clear indication that the operators have focused on densely populated parts of the country, leaving some parts uncovered. Another reason for apprehension is that most operators are not sure how the fund will be managed and do not trust the CCK as a manager for of these funds. At moment, there is a consultancy firm that is carrying out access gaps and perhaps they will create a strategy.

Conclusions and Recommendations for Policy Actions

Kenya has made progress in the telecommunication sector since the 2007 review. This includes the establishment and implementation of the interconnection guidelines in 2007, the strategic positioning of the ICT sector in Kenya Vision 2030, the passing of the Kenya Communications (Amendment) Act, 2009, and the introduction of new regulations in 2010 that address the interconnection issues, anti-competitive practices and dominance issues. The landing of three marine fibre cables at the coast of Mombasa in 2009 and 2010 will have an impact on pricing and lead to the introduction of more value added services all benefiting the consumers.

The landing of three marine fibre cables at the coast of Mombasa in 2009 and 2010 will have an impact on pricing.

Table 28 concludes issues discussed and recommends policy actions.

Table 28: Summary of findings and recommendations for policy

Issue	Conclusions from the Study	Recommended Policy Actions
ICT policy	The environment has changed significantly since the ICT policy was formally approved in 2006. The implementation of the existing policy was not well coordinated.	Review the national ICT policy Create detailed plan for the new policy implementation that is aligned to Vision 2030.
Legal framework	The Kenya Communications (Amendment) Act, 2009, does not address all aspects of e-transactions, is not harmonised with the East African neighbours.	Review the Kenya Communications (Amendment) Act, 2009, and harmonise with the East African neighbours. Create a separate e-transaction legislation.
ICT Institutional framework	There is overlap in the roles of the National Communication Secretariat and the Kenya ICT Board with respect to advising the government on ICT matters.	Review the institutional framework for ICT policy formulation and implementation.
Broadband infrastructure and services and USO	The national fibre infrastructure (NOFBI) is ready but has not been put into operation. The national fibre infrastructure does not have countrywide reach USO obligations are highly ineffective.	Operationalise NOFBI immediately to make broadband services available to many rural areas. Sensitise the public on the impact of ICT services on their lives Plan and implement Universal Access in consultation with stakeholders and in line with best practice.
Number portability	Number portability has been under discussion since the end of the exclusivity period in 2004 and little progress has been made Customers feel captured by the operators and find it difficult to move across networks	Implement number portability in the next one year.
ICT funding	ICT funding has not been adequate and sustainable.	Allocate adequate funding for ICT from internal resources (not donor funds).

Table 28: Summary of findings and recommendations for policy

Issue	Conclusions from the Study	Recommended Policy Actions
Regulation and anti-competitive behaviour	<p>Dominant operators often practice anti-competitive behaviour and abuse their powers of dominance. Hopefully the Fair Competition and Equality of Treatment Regulations published in March 2010 will address the issues of dominant operators and abuse of dominance. Dispute resolution regulations offer guidelines on how disputes will be resolved between all the players.</p> <p>Regulator has been ineffective in regulating quality of services. However this may start happening with the Compliance Monitoring, Inspections and Enforcement regulations, which among other things aim at ensuring provision of modern, qualitative, affordable and readily available communications systems and services in Kenya.</p> <p>Broadcasting sub-sector has resisted regulation by CCK.</p>	<p>Strengthen CCK to have adequate power and more autonomy to make decisions.</p> <p>CCK to faithfully enforce regulations on quality of services and anti-competitive behaviour.</p>
Spectrum	Access to spectrum is ineffective (not transparent, etc.)	CCK to implement transparent and non-discriminatory methods to allocate spectrum
Tariff regulation	<p>End-user Internet/broadband tariffs are still too high in comparison to average incomes.</p> <p>Tariff regulation was found to be highly ineffective. However the CCK has issued tariff regulations that will address issues related to tariffs. Further interconnection and provision of Fixed links, Access and Facilities regulations will address pending interconnection issues resulting in better tariff regulations.</p>	CCK to faithfully enforce regulations and implement other mechanisms to regulate tariffs and specifically bring down Internet and broadband tariffs.
Data	Accurate data is not readily available Information on the CCK's website is inadequate and not up-to-date.	<p>Strengthen the data unit in CCK and have it work closely with the Kenya National Bureau of Statistics (KNBS).</p> <p>Strengthen KNBS and mandate it to collect ICT data and provide timely and accurate statistics.</p>
e-services and information	Limited e-services and information to businesses and the public by the government.	Implement key applications that provide information and services to the public and businesses.

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